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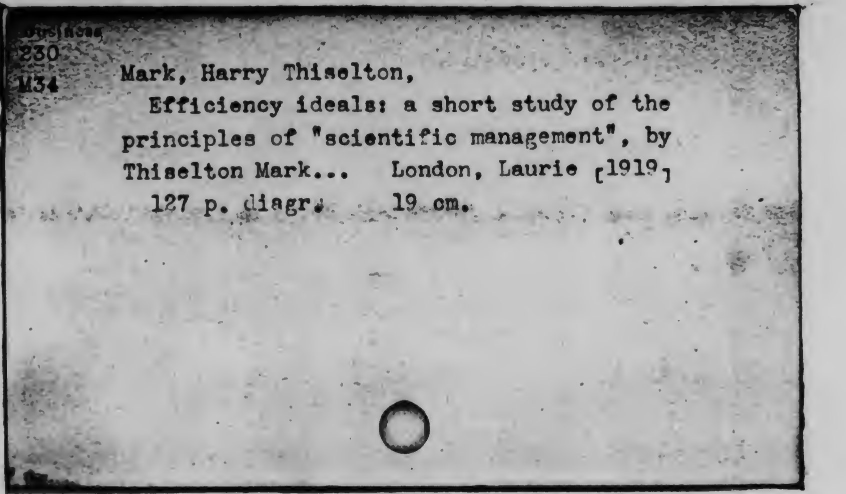

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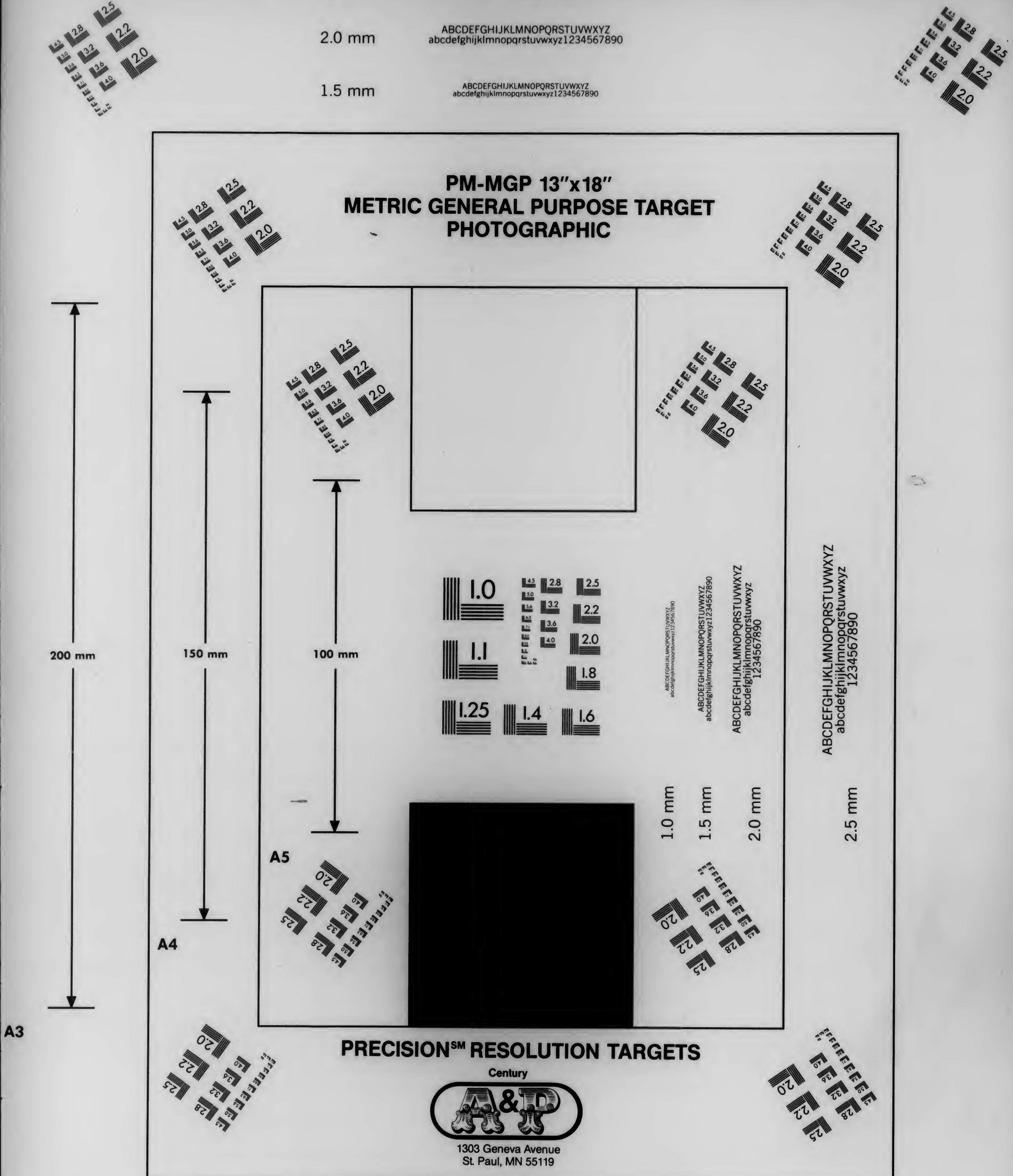
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Mr. T. H. PEAR,

Lecturer on experimental Psychology

in Manchester University,

and to

Major W. H., H. B. D., L. A. M.,

S. T. B., J. C., W. B. L., J. M.,

T. H. C., L. J. A. H., J. McF., and

other Colleagues and Fellow-workers

at

H.M. Factory, Victoria Works.

Efficiency Ideals

A Short Study of the Principles of "Scientific Management"

BY

THISELTON MARK, D.Lit., B.Sc.,

Late Shuttleworth Scholar (Economics)
at Owens College, Manchester.

Author of "Education and Industry in the United States," etc.

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"*One of the great lessons of the war is that our industrial system is capable of almost indefinite expansion.*"—Mr. G. H. Roberts, M.P., in "After War Problems." 1917.

"*In the general enthusiasm that is growing up there is a wider impulse—the impulse to see that the health of industry and the health of society cannot be distinguished, and that the nation which develops all its resources of mind and happiness will also be the most efficient in serving the industrial needs of the world.*"—*Manchester Guardian*, October 7th, 1918.

"*Now who are the employers to-day? You think that I am one—great delusion. You think Ford is one—another delusion. We are not employers; the people who employ myself, and every one who works in the business I am connected with, are the consumers. Let consumers buy other products made by other firms, and where are we all at our works? Let the consumer of motor-cars buy other cars than Ford's, where are Ford and his workmen? The employer of Ford is the consumer . . .* 90 *per cent. of those that employ me are working men and their families.*"—Lord Leverhulme in "The Six-Hour Day."

"*We do not as a nation, and as traders, fully realise the vital importance of finding a remedy for the industrial unrest which exists in all trades. A recurrence of such upheavals as those of* 1911 *and* 1912 *has only to occur once or twice to put an end for all time to British trade as that term is now understood.*"—E. J. P. Benn in "Trade as a Science."

"*True efficiency must spring from the genius of the people themselves.*"

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INTRODUCTORY

THIS short monograph is written chiefly for such as wish to know the general drift of " Scientific Management " proposals, and to have them presented in small compass. It is in the main, as the title suggests, a résumé and an interpretation of propounded theories. None the less, the nucleus of the little book was a personal study from experience.

Though brief, the treatment is not hurried. None of the systems referred to are regarded as perfect or final; or as though they contained the Alpha and Omega of the whole matter.

Accordingly, the following freely-written résumé of principles of management as studied (and to some extent applied) in America, Japan and Germany, and as in quite recent years advocated amongst ourselves, is not given from any one source or set of sources, but with an eye upon criticisms alike from welfare-workers and the labour-world. The interpretation offered of these principles is in terms of their possibilities if adequately applied, as part of the remedy for the world's shortage of commodities; as a solvent of much industrial unrest; and as a permanent contribution to the humanising of what is in many ways the most vital of all human interests, that of industry. Already the Peace Year, 1919, promises to stand out in the world's history as the first in a new era of mutual understanding. The spirit of these short chapters is in keeping with this good omen.

In balancing view against view, the writer has absolutely no axe of his own to grind. He has worked for a short time on shift, and been a member of the General Workers' Union. At the time of writing, he was officially associated with the process management at an extensive works.

A second line of thought running alongside of this, and one which the references to education of various types illustrate, is the personal value to the worker of whatever grade of a new spirit in industry which aims at the enhancement of individual power and of joy in work. We may still accept Herbert Spencer's statement that the aim of education is "complete living" and the "unfolding of our individualities to the full." From this standpoint, education can scarcely be said to be achieving its end unless it contributes largely to the enrichment of man's industrial life and to his enjoyment of that life. The theory of industry rests ultimately upon a theory of life.

In order to get at once to the heart of the subject, the first chapter presents a brief survey of the principles of Scientific Management.

EFFICIENCY IDEALS

CHAPTER I

A GENERAL VIEW OF "SCIENTIFIC MANAGEMENT"

"*There is only one way of paying off the accumulated debts incurred by this war; that is to make goods and sell them. To do this we have got to organise the nation in a big effort of industrial production.*"—LORD RHONDDA (quoted by Mr. E. J. P. Benn in "Trade as a Science").

"*The industrial world is coming more and more to feel that all work is done under certain broad principles.*"—M. L. COOKE, of the American Society of Engineers, in a report to the Carnegie Foundation.

THERE is promise of an extensive literature dealing with the problems of business management. But before there can be a literature there must be investigation and some sort of reliable data resulting from investigation. For some years investigations of this kind and published accounts of them have attracted attention in America; and, notwithstanding cross-currents of opinion, have been far-reaching in their effect. Since the outbreak of the war—and the early realisation that the future must of necessity witness a break with the past in almost every direction—British interest has been awakened in these themes. With America, Japan, and Germany actively studying the application of "efficiency methods" in industry, the time had come for British industry at least to inform itself as to what the new notions are. As usual, the way had been pioneered by a number of progressive firms; and Britain can show noteworthy examples of the combining of employer's responsibility with employer's and employee's advantage.

Just because the American literature of the subject is more elaborate and diffuse, in addition to being more extensive, it is probably best for the student of the subject to begin with some such books as Harrington Emerson's "Twelve Principles of Efficiency," or F. W. Taylor's "Principles of Scientific Management," together with Professor Hugo Münsterberg's "Psychology and Industrial Efficiency." Taking these three books alone, one has a fair insight into what America has been doing. Mr. Taylor's book is largely an account of actual experimentation and practice as an "efficiency engineer" on different plants in America, giving the reasons for the methods adopted and showing the results that followed. Harrington Emerson's book systematises and elaborates from a similar point of view. Münsterberg presents the case from the standpoint of a university psychologist,

anxious to give life and larger meaning to his subject by following it out into its practical applications. From works yard to university laboratory is the scope of these three typical books.

For the purpose of a summary statement, however, one can scarcely do better here than start with A. D. and M. McKillop's "Efficiency Methods," a book published in this country; supplemented, from the Trade Union standpoint, say, by G. D. H. Cole's "Payment of Wages." The former summarises the new ideas under two headings (implying, it is true, all, or nearly all, of Taylor's five or Emerson's twelve). The first main characteristic is described as the taking into view of the *complete round of activities*, observing and recording results with the object of fixing upon a "standard best" at each stage; then making the results known as widely as possible so that each may know what is on record, and so that every worker's "skill, experience, and observation" may be "available for his fellow-workers and the whole business." The second characteristic "follows on this," namely, the "adoption of educational methods and ideals."* The authors go on to explain that when a standard best method for an activity has been worked out, as in the art of cutting metals, it must, of course, be taught. There will not be fewer foremen and supervisors; but their work will have a more professional character—that of specialists. Hence the new methods have been described by a commission of scientific management experts in America as a process of transference of skill from management to worker; the type of official needed for such a change being the practical man who can demonstrate.

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* To many, no doubt, a strange-sounding expression in this connection; but it is descriptive. It stands for the direct human touch, and for the upspringing in industry of something of the British "Public School" or sportsmanlike spirit, as well as for an ideal of enlightenment and an intenser interest.

Dr. F. W. Taylor's five principles are readily seen to harmonise with McKillop's two. They are: (1) the application of scientific methods in place of methods of rule-of-thumb; (2) the securing of an atmosphere of harmony in place of discord; (3) the replacing of individualism by co-operation; (4) maximising the output instead of restricting it; and (5) the development of each man up to the point of his greatest individual efficiency and prosperity. The results, says Taylor, are to be the maximum prosperity for both employer and employee, obtained by means of increased production at decreased cost, and by means of the mutual understanding which he regards as, perhaps, the greatest gain of all.* Taking the wide view,

this means also a larger profit to the whole world.

Taylor looked upon deliberate under-working, "soldiering," as the Americans call it, as the greatest drag upon industry, though he is thought by competent judges to have exaggerated the extent to which it is practised either in America or in Britain. He believes that the new methods supply the remedy. (1) They meet the fear that a maximum production will throw some out of employment by impressing the fact that greater economy in production reduces the cost; the consequently lower prices increasing the demand for the article produced, and so reacting stimulatingly upon production. (2) The new theory of management does away (as a result of direct study and investigation) with the ignorance on the part of employers as to the time work should take, making it, since the worker also has access to the same knowledge, no longer necessary for a man to work slowly in self-protection. It is to the employer's interest, as well as the worker's, not to "speed up" to the point of fatigue or overstrain. (3) And, further, with the advent of a better mutual understanding, the obstacle is removed to the workman's seeing that by sheer physical law, low production keeps down wages. It is only possible to sell what is made. This absolutely fixes the amount available for division amongst the producers.

Dr. Taylor is famous for more than one

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* **Urging the need for an industrial awakening, Mr. C. W. Macara (in his book, "Social and Industrial Reform") says: "To organise with a view to increased production, and not to take into account the position of the rank and file of the producing army, must be fatal to production."**

successful application of his principles in Works management. Two of his best-known successes are in connection with the rough-and-tumble work of pig-iron handling and shovelling. The story of each will bear repeating. The case of the pig-iron handling dates from the time of the American-Spanish War when the Bethlehem Steel Company was working for the United States War Department. In the work of loading pig-iron, investigation showed that a first-class man ought to be able to do 47 to 48 tons a day; but the average was only 12½ tons daily. After verifying the higher figure, the managers were face to face with the duty of getting the larger amount done, and of getting it done without quarrelling with the men, but rather, if possible, making them more contented. One workman was picked out; for the two reasons, that he was observed to be apparently as fresh at the end of the day as at the beginning, and that he was thrifty and keen on the dollars. He was called up and asked if he was "a high-priced man." He did not know. (He was at the time receiving $1.15 a day.) Well, they said, a dollar eighty-five man was a high-priced man. "Oh, yes," agreed Schmidt (a Pennsylvanian Dutchman to whom this is given as a *nom de guerre*), he was "a high-priced man." He was then shown a pile of pig-iron and a truck: could he "load that pile in a day for $1.85?" He could. "Then you'll do as this man (Dr. Taylor) tells you. A high-priced man does

that; rest when he tells you to rest, and work when he tells you to work." The next day Schmidt tackled the pile and earned the high-priced man's wage. But had he gone blindly at it, he would have been exhausted before noon. Hence the need for what at first sight seems exceedingly mechanical and meticulous, the absolute timing of the man's movements throughout the day until he acquired the habit of resting at proper intervals. The ideal pig-iron handler is of the ox type, a man of low intelligence and considerable physical endurance. But, even so, the raising of the day's tale from 12½ to 47½ tons was only accomplished by applying the discovered fact that even a selected first-class workman can only be under load, if his day-to-day efficiency is to be maintained, 43 *per cent. of the day*. For 57 per cent. of the day he must be entirely free from load; i.e., if he is handling pigs of the standard weight of 92 lbs. (With half pigs, 46 lbs. in weight, a first-class man might work 58 per cent. of the day, being free from load the remaining 42 per cent.) In this case, Schmidt kept up his total of 47½ tons day after day, to Dr. Taylor's knowledge, for three years (i.e., up to the time of Dr. Taylor leaving the works). As to Schmidt's colleagues, it was found that seven out of eight of them were misfits: they were at their wrong job. Almost all of these were found work more suited to them on the same plant—a benefit to them by giving them work for which they were fit in place of work for which they were unfit. From other portions of the plant, supplemented by a few who were brought in from outside, sufficient men of the right type were found to put the work through expeditiously at Schmidt's pace of 47½ tons daily and as "high-priced" men.*

The case of the shovellers brings out another phase of "scientific management," namely, the adjustment of conditions. It was found that the best average load for a first-class shoveller was 21 lbs. So the shovels varied with the work. The rule-of-thumb practice—each man his own shovel—meaning a difference in load of from 4 lbs. (a miserable underweight) to 30 lbs. (a serious overweight) according to what he was handling, was set aside, and, the work being known and planned out in advance, each man received as he came on a note indicating the tools he needed to start with.

There are, therefore, in Taylor's opinion, three duties for the management: (1) to "develop a science" for each man's work in place of following rule-of-thumb; (2) to select and train the workmen, instead of letting them blindly choose their own work (or equally blindly appointing them to work), whether or not they are suited to it; (3) to co-operate in a spirit of real leadership with the workers, industry being a shared (rather than an imposed) task. The most marked feature, Taylor considers, in "scientific management" is the idea of the planned task. Each man's work is planned a day in advance. This means a new office with its own staff; but it spells efficiency. Each man receives a note indicating his task, and the time and method assigned. If he carries it through, he receives an efficiency bonus on his time wages. Foremen and supervisors are to be there to co-operate in any way needful.

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* There is a sequel to this story. The same ore was being delivered at Pittsburg, where they were short of ore-handlers. Hearing of the Bethlehem men, they sent an agent to outbid the Bethlehem price, offering 4·9 cents a ton instead of 3·2 cents. The Bethlehem management decided to allow the men to go; since they were already earning 60 per cent. more than the average earnings in the neighbourhood. (The management had come to the conclusion that up to 60 per cent. an increase tended to improve the men, making them more thrifty and sober, and steadier at their work; but any marked increase above that level tended to irregular working, extravagance, and dissipation.) Nearly all the ore-handlers went to Pittsburg, but in about six weeks' time most of them were back again (having been told that there was always a job for them should they return). One of them explained their returning. He and another were on a car with eight of the Pittsburg workers. He and his friend started to work at the Bethlehem pace. In less than half an hour he saw that the man next to him was doing almost nothing. He asked him why he did not work faster, saying that there would be very little money if they did not work faster than that. In the altercation that followed, the Bethlehem worker saw that the rest of the men were backing up their Pittsburg mate, so he said to his friend: "You and I will throw a shovelful whenever this man throws one, and not another shovelful." On pay day they received less than at Bethlehem, in spite of the higher rate per ton. So they went to the "boss" and asked to be allowed to work on a separate car. This was refused; so, after another pay day, still with less money, they decided to return to Bethlehem.

Not only, of course, has no group of writers, however successful in their own experience, any monopoly in these principles, but there are directions in which the idea as a whole has yet to win its way; and on its advocates rests the onus of winning over certain critics on points concerning which they are not fully convinced. It is noteworthy that the attitude of the Trade Unions is, so far, not cordial; the view being held that the methods, divorced from their true spirit, are capable of becoming a means of "speeding-up," pure and simple.

Accordingly, no glance, however casual, at American advocacy would be satisfactory which did not take into view such statements and criticisms of the new principles and methods as are contained, for example, in Miss Josephine Goldmark's book, "Fatigue and Efficiency." The new principles are, she says, essentially "a philosophy, not a new routine"—a combination of many elements, some previously tested, some new. This writer is fully alive to the distrust with which scientific management is viewed by organised labour; and admits that it has still finally to prove that its results are not the outcome of increased strain on the workers. This latter point has been investigated in the interest of women workers in certain cotton mills in America, where the new methods had been adopted; and, though the report showed some uncertainty upon the point under investigation, it finished with an acknowledgment of "the entire equity and candour shown by the management in facing situations unfavourable for the women workers' health, and their sincere intention of the best practical readjustments." If this were known to apply universally, there is very little doubt that much of the opposition would vanish.

At the Bethlehem Works, just referred to, the efficiency experts are no longer employed. Yet Mr. Charles M. Schwab retained many of the methods they had introduced. His own methods he has described in recently published interviews. He has faith in the human element of sportsmanship as a factor in industrial life; whether it be as a sporting rivalry between groups—be they shifts on the same Works or nations competing in the same industries—or as a sportsmanlike co-operation and recognition of common interests. If, for example, he succeeds by casual suggestion in quickening a keen emulation between shift and shift, the *positive result* is co-operative effort on the part of the members of each individual shift. As a principle of management, profit-sharing stands in the foreground of Bethlehem Works policy, Mr. Schwab speaking of the employees as his "20,000 partners." Each worker of whatsoever grade participates. Every 300 workmen have the power to elect a representative with rights of approach to the management. Being prepared to admit that the costs of war have brought about great changes in the outlook of the capitalist employer, Mr. Schwab holds that radical misunderstanding between capital and labour may be avoided by each meeting the other half-way. Along these lines the famous iron-master finds grounds for optimism concerning the trade of the very near future.

One naturally desires to know in a little more detail how organised labour in its published utterances stands with regard to the proposals. A well-balanced account of scientific management is given in the Labour Year Book for 1916; and more elaborate surveys and criticisms are contained in the writings of Mr. G. D. H. Cole. A distinction is drawn between two meanings of the word "management." It may mean either the higher control and the body of men exercising it, or it may refer to the process, or method, or to the spirit of an industry (including especially the human factor, namely, the individual workers of whatsoever grade and their relationship to each other and to the work). Taking the latter meaning, there are aspects of scientific management with which the labour world is in entire agreement. It is obviously not foreign to their view to assert that management, as it hitherto existed, can lay no claim to perfection. The tendency of labour opinion is to endorse many of the suggestions for greater efficiency in so far as they refer to the extra-human or inanimate factors in the process.

There is room, labour leaders will tell us, for more "science" in such directions as industrial research, factory administration, the estimating of costs, the routing of jobs, the co-ordination between shop and shop, and so forth. But with regard to the human side of scientific management, labour is frankly critical, if not suspicious. Its point of view is fairly expressed in the statement that "the social life of man is finally not a matter of abstract science, but a matter of positive will." *

Even if, as its advocates contend, scientific management would provide against the unfair cutting of wage rates ("an essential step if the level of production is to be raised"), this would not do away with labour's objection on the ground that scientific management *might* after all become but a tool in the hands of the individual employer enabling him, with greater advantage to himself both in output and in profits, still to treat his employees as part of the great machine, raised by the new methods to a higher level of mechanical efficiency.

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* To this statement it is possible, of course, to reply that any system which has a psychological foundation, that is, which considers human action in the light of the impulses, motives, and interests which *move the will*, is scientific. Psychology has been long in coming into its own. Yet the fact remains that it is the one science which the good salesman, advertiser, traveller, or foreign representative consciously or unconsciously applies. So say those who advocate "scientific" business methods in America. Experimental psychology may justly, as Münsterberg says, claim a place amongst the technical sciences. Indeed, as far back as 1900, the writer visited the National Cash Register Company's place at Dayton, Ohio, and found ample illustration of the application of psychology to business methods. The same psychological groundwork, authorities tell us, underlies the Pelmanist system, which is somewhat notoriously leading the way in efficiency propaganda in Britain and her colonies to-day.

Collective bargaining must be provided for. There would be no hope for the acceptance of ideas which promise success only on condition that the workers are treated individually. For, alongside of our individual impulses and ambitions, we have social impulses, " a craving for harmony and mutual support." So far from being a disadvantage in industry, this social instinct may well be taken into account as part of the situation. We find one American writer even urging that the tendency should be to eliminate the individual bargain as far as possible, and to substitute collective bargaining. And, on this side of the water, the McKillops (in their book, " Efficiency Methods ") deny that individual bargaining is in any way essential to scientific management. Frank acceptance of the collective bargain is the surest guarantee against any intention to exploit labour by the old " speeding up " device in a new guise.

CHAPTER II

THE IDEAL AS A FACTOR IN INDUSTRY

" *Humanity . . . will never lead us to foster the bad tradesman. We give our custom to the better man. Broadly speaking, what is true of individuals is true of nations, trade supremacy being ours only so long as there is no abler competitor in the field.*"—H. E. MORGAN in the " Dignity of Business," 1914, a pre-war publication.

" *That fine pioneering instinct which inspired the forefathers of British commerce and still upholds our reputation as a great seafaring and exploring nation.*"—*ibid.*

THE author of the words above quoted devotes two of his chapters to showing that Germany, France and the United States were forging ahead because of their realisation of the connection between education and industry. He strengthens his case by putting forward a general claim, which is too often overlooked and which gives unquestionable educational value to business knowledge, namely, that *business and business knowledge can be applied to almost every walk in life.** Every career, that is to say, calls for some system, some thoroughness, some enterprise; and there is always value in the forms of knowledge—by no means narrow in their range—which give meaning to industry, and, by so doing, tend to quicken practicality. Such forms of knowledge, equally with the liberalising and chivalrous impulses never absent from true enterprise, are factors in efficiency. Industry may thus be viewed generously, on a large and liberal scale; the more so as it is one of the prime agencies in securing the well-being of the world.

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* This fact, one may note in view of later educational references, makes interesting appeal to the professional educator.

At the heart of industry are the higher creative impulses. Man lives to achieve and to produce. The ideal is a factor in industry.

How, then, is this ideal to be described? In two ways. There is an ideal, so to speak, *within industry*; an ideal of the life lived in the

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To the full extent of its being true, it has meaning for every boy and youth before him. Each is citizen, man, and *worker* in the making. The passion for making men makes the teacher a "master builder." And the awakening and strengthening of that passion stand in the foreground of the art of teacher-training.

The plea of the author of "The Dignity of Business" is for ampler recognition of the world's industrial and commercial interests at our Public Schools and Universities. This does not mean the commercialising of education. Of that we do well to fight shy. On the contrary, the author argues that whilst these interests are neglected the term "liberal education" has only limited justification. Similarly, whether we are thinking of apprentice school or efficiency system, we are on safe ground when we remember that efficiency in business is not narrow and specific, but is one of the manifestations of a developed personality and of personal force.

factory or on the works (naturally including the industrial ideal or ideal of management contributing to this life). It is this ideal within industry with which theories of management are mostly concerned. There is also an *ideal of industry*; our conception of its meaning and its aim.

(*a*) Probably the most elaborate statement that has yet appeared of efficiency ideas is that contained in Harrington Emerson's "Twelve Principles of Efficiency." The first of his principles is "a clearly defined ideal," which corresponds to the industrial ideal (or ideal of management) just spoken of. "A century ago," he writes, "a bright young journeyman who started out to manufacture some special line was definitely aware of what he intended to make and how the work was to be done. He knew what he wanted. At the present time, in large plants men succeed to authority by transfer or by promotion and are very often without definite conceptions of the purposes for which the plant is working.* Workers and foremen at the lower end of line organisations are so far from the 'Big-stick' who dictates all policies, who alone is responsible for organisation, for delegation of power, and for supervision, that they are driven to create minor ideals and inspirations of their own, these being often at variance with the ideals of those above them. If all the ideals animating all the organisation from top to bottom could be lined up so as to pull in the same straight line, the resultant would be a very powerful effort." What is to be aimed at, accordingly, is a unified life.

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* Advertisements sometimes contain good reading. This, it is no compliment to many who have written upon it to say, is the case with Pelmanism. As, in this public way, it unfolds its secrets to us we learn that it has in view four vital elements: "Purpose, Interest, Energy, and Will Power." "It will be found," we read, "that the reason why so many lives are ineffective and why so many men miss success is this—they have not worked under the impulse of a clear, definite purpose. . . . Often it is found that, whilst a man is professedly a banker, or an engineer, or a solicitor, or an engine fitter, really his heart

To the present writer, it is the conception—even the definition—which we form in our minds of the nature of *organisation* which will largely determine our theories of management, and which will certainly give direction to our manipulation of man power. We cannot too often remind ourselves that organisation and mechanisation belong to different worlds. Organisation, as the word itself denotes, is an affair of life; whereas mechanisation is an affair of machinery. In the inorganic world we handle materials, which resist, certainly, according to the action of certain measurable forces; but in the organic

world we deal with elements which have an inner tendency of their own: a law of individual being which determines the general trend of the life of the organism in pre-ordained directions. The captain of industry who turns from the consideration of his plant to questions of organisation passes from the domain of physics into that of biology—biology, too, in its highest and most complex form, namely, the laws of human (physical and mental) well-being. All the sciences which deal with man may be laid under tribute. A complete theory of organisation will take note of principles of physiology and hygiene—including the laws (at present under investigation) governing expenditure of energy and fatigue; and principles of psychology —including studies of aptitude and temperament, the nature of interest, and the part these play in the worker's efficiency. One says all in saying that organisation is an affair of life.

Life implies unification. A business is a single organisation. Whenever there is clearness of aim, and a whole-hearted realisation that organisation is really the harmonious adjustment and unification of the whole life of a works in pursuit of that aim, an ideal is present.

(*b*) There is also an *ideal of industry*. In the social sense industry, we might say, is to the community what constructive activities are to the individual. Through industry the community lives a life of fuller self-expression; is

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is not wholly in his work. The reasons may be various. He does not fit his work, or his work does not fit him. He has grown tired, or he has lost interest. In short, the edge of his purpose has become blunt, and so he is not cutting his mark upon the things which make up his daily calling." "Purpose" in this context is practically identical with the "well defined ideal" of Harrington Emerson.

healthier; has better knowledge of itself and of its powers. Only a working nation can be a fit nation. But, further, only a working nation can be a progressive nation. Man's industrial activities are fraught with meaning. They not only bring into operation the working hand and the working brain, but they imply aims, ideals, and emotional interests, expressible partly in terms of satisfaction of sense, partly in terms of man's realisation of the good, the beautiful, or the true. From this richer point of view, industry aims not only at the maintenance of existence, but at the furtherance of life. It is a means towards the achievement of life's ideal ends. There may be considerable truth in what Mr. E. J. P. Benn says, that to the average individual trade is "an unpleasant necessity, a means to an end, a thing to be done as quickly as possible, and to be forgotten and left at the earliest opportunity. It does not often occur to either the workman or the master that in producing a useful article he is helping along civilisation, adding to the well-being of mankind, improving the health and comfort of the nation, or making the world a better place as a result of his efforts." But this is far from being the whole truth. The ideal is more with us than we know. For the ideal is the real, lifted up and interpreted. If, then, as has been said, "it would revolutionise industry if some ideal, other than money, could be inspired during times of peace," the elements at least of such

revolution are not far to seek. We all appreciate in some degree the meaning and real values of industry; and the existing shortage of commodities of almost every kind—the inevitable sequel to a great war—has tended to quicken this realisation.

During the war-period, and the long years preparatory to it, the world has been a threatened world. Now, it is a threatened and also a pauperised world. Threatened: for Kaiserism (with all that its spirit stands for) is not dead. Nor had Germany, nor has any social class (as Bolshevism proves), a monopoly of it. It is also a pauperised world. Industry is called upon to-day, as never before, to supply the world's homes with needed commodities, including commodities answering to our most elementary needs, food, clothing, warmth.

How do we stand in view of this twofold stress? Regarding the first, do we not, if we probe deep enough, find proofs that often the really opposing elements in industry are not labour and capital, nor worker and management, as such; but a certain high-handedness, on the one side, and unrest beneath its assumptions on the other side? This is certainly part of the rationale of industrial strife. Democracy, that is to say, is moving towards self-discovery along industrial rather than along political paths, especially in countries like Great Britain where, in a formal sense, the political fight is already won for democracy. In such countries the voice may often be the voice of revolt when the spirit behind the voice is a spirit of aspiration.

Concerning the world as pauperised; this also constitutes a unifying appeal; one which, ideally conceived, dissolves antagonism in terms of concrete needs and of our common interest in their satisfaction. A vitally human situation has arisen. The traditional idea is that industry may be summed up in the notion of somebody having money, paying somebody (usually not more than he is obliged) either to render him personal service or to make things which he can sell and so add to his personal wealth. This traditional idea (with all the reality that it rests upon) further explains the two camps into which, industrially speaking, we have been driven. The result is antagonism of interest, where there is no absolute antagonism of life. To be really secure, the future must build itself upon the foundational truth that, rightly esteemed, the vital interests of labour and capital, of employer and worker and consumer, may be harmonised.

With the human situation that has arisen it is within man's power to deal. Possibly many of the traditional forms and methods of management (in spite of noteworthy ameliorations either spontaneous or legislatively enforced) will need to give way. Almost by common consent some form of " scientific management " must come.

When " scientific management " is applied in the spirit as well as in the letter, the ideal *within industry* will be in harmony with the *ideal of industry*; the pursuit of each contributing to the strength and to the well-being of the race.

In developing this theme in the chapters that follow only casual illustrations can be given, but the principles, taken not separately but as aspects of a unified life and aim, are capable of general application. To industry as to other phases of the world's institutional life, Mr. Clutton Brock's words apply: " There is a majestic order we can attain to. . . . The prophecy of it is in our minds. . . . We become human only in the effort to reach it."

CHAPTER III

Some Aspects of Scientific Management.

THE LONG VIEW—TAKING COUNSEL—DISCIPLINE—THE FAIR DEAL—RECORDS—DESPATCH *

> "*The French trade unionist is profoundly interested in increasing production by the substitution of order and science in the application of human power for the blind and incoherent efforts of the old industrial system.*"—Paris letter in *Manchester Guardian*, January 15th, 1919.

> "*The amazing sweep of prohibition . . . the culmination of a steadily rising tide . . . continuously reinforced by the efficiency movement in industry*" ["*the public health crusade, and public reprobation of the activity of the saloon in politics*"].—New York correspondence, *Manchester Guardian*, January 18th, 1919.

One of the aspects of scientific management, that of the unified life or clear and clearly recognised ideal, has been touched upon. In Harrington Emerson's treatment this is followed by four other so-called "altruistic" principles

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* Taking Harrington Emerson's enumeration, the whole of his twelve principles are quoted or implied in these central chapters. Otherwise, of course, the treatment is quite free.

This is not, after all, a strained description; for over and above the call of the hour, scientific management, adequately interpreted, deals also with the perennial call of the man. Of the two things which most closely bind men together—mutual liking and a common purpose—industrial strife has run counter to the spirit and the possibilities of both. It separates men who have discovered themselves at round-table conferences to be eminently capable of mutual esteem. It thwarts the industrial ideal which is based on singleness of purpose and community of interests. Industry may be so carried on that the well-being of all producing classes is seen to be interdependent. The two quotations heading the present section (the one a direct testimony, the other an incidental "aside") point to a growing recognition, in more than one country, of the possibility of better things, both socially and industrially, under the influence of new ideas and a new spirit: new, not always in themselves by any means, but in being thrown together to form a system. Some of the simpler and more general of these ideas will be enumerated in this chapter.

(*a*) The principle of *the long view* may be regarded variously. Partly, it would be an offset to the disturbing effect of industrial spurts, spells of furious working with overtime and over-production as attendant evils. It takes a courage, which requires long vision to give it support, for a manufacturer to decline an order on the ground that his hands are already full, i.e., if he is to work evenly and to maintain a permanent and steady output. The "tonnage mania," which accompanies periods of trade boom, brings with it (as a matter of common observation) over-equipment of plant, over-building of factories to meet what in the dull times that follow is seen to have been a temporary (or at any rate a too eagerly anticipated) demand, and over-staffing followed by unemployment.

The principle of the long view enters also into the planning of the life and routine of a concern. It is long-visioned common sense applied to current practice. Very much of a manager's or a subordinate official's time is wasted in dealing with emergencies that need never have arisen. The official may show common sense and resourcefulness in dealing with the emergency; just as the employer may do, when working for over-production and big profits at one time, and cutting down his costs *expensively* at another time. But in these cases it is frequently short-visioned common sense that is called into play, rather than long-visioned common sense. There is, to borrow Harrington Emerson's metaphors, a good deal of personal exhilaration in surf-riding, but the man who guides his ship by log, chronometer, and observation of the stars gets further. (Short-visioned common sense led Britain to part with Heligoland—"a crumbling island," we were told, "doomed to disappear"—in exchange for a strip of territory in Africa.)

Many of the expedients and methods coming under the head of standardised operations and standardised conditions, to be mentioned later, are an application of this notion of the long view in Works practice. In the present context it may be exemplified by a quotation from "The World's Work" (New York, 1918): "It is because Henry Ford very early grasped that fundamental rule of life—that you can't get rich by thinking only of money—that he is one of the world's richest men to-day. If he had tried to get all the possible profits that could be made on each car, he would not to-day be the maker of almost half the automobiles that are turned out in the world." Lord Leverhulme, again, has shown the long-view type of enterprise in his purchase of the island of Lewis. He "has discovered a territory much of which is as undeveloped as the western prairies of Canada and with potential wealth proportionately great," and "is setting himself to work in hearty co-operation with the islanders to develop, by the introduction of capital, science, and organisation, the natural resources of the island and the waters surrounding it."

(*b*) Another principle of efficiency in management is the acceptance of *adequate counsel.* It is little other than a phase of short-visioned common sense to trust too exclusively to one's own judgment, especially in the disregard of research and unreadiness to make use of expert opinion. A proposed $800,000 remedy, involving dislocation and reconstruction, has been known to be replaced by an equally effectual but very simple remedy costing only $800, purely as a result of seeking expert advice.

(*c*) The morale of management will thus have behind it the steadying influences of a recognised ideal tending to unification of life and effort, of a bid for permanence, and of good counsel. It will also depend upon the *spirit of the organisation*, which gives direction alike to capital and labour. In the highest form of discipline all are regulated; and all are free. Sheer dictation from one to others is replaced by laws which all observe because they are the rules of the game. [There is still something to seek in a morale which depends upon the pressure which mere commercial inducements cause workers to bring to bear upon each other. Examples of this sort are sometimes quoted as ideal. They may or may not be so in actual practice according to their spirit.] The master-impulse, and that which makes discipline (in the broad sense in which we are using the word) secure, is each man's consciousness of participation, with a definite assurance of personal benefits, certainly, but also with a personal interest in his work based upon knowledge of its meaning in relation

to the work of others who are contributing cooperantly with him to the life of the concern and to community welfare.

(*d*) The last of the "altruistic" principles, according to the analysis we are following, is that of *the fair deal*. But, as is admitted, none of these principles is self-supporting. So far as the relations between workers and management go, items in the "fair deal" are included in the standardising of conditions, the selection of workers, the standardising of operations and other aspects of management still to be referred to. As a general "altruistic" principle, the fair deal involves the human factor—real care for men; some play of imagination in thinking of their working conditions; and, of course, a desire to be just, with, again, some reflective play of the imagination in appreciating what justice between man and man demands. A simple illustration: A dense fog; day-workers knocking off work after dark on a winter evening; some men working at a distant part of the plant where there were dangerous obstacles, even big holes into which they might fall. The men crawled about for some two hours on hands and knees before finding their way out; the management, less through lack of caring than through unimaginativeness, having totally forgotten them and left them to their plight. This would be an almost trivial example, were it not illustrative of an attitude of mind. A feeling of grievance is left behind after an incident of this sort; the worker is aware of not having had quite fair consideration.

Two other of the more or less universally observed principles put forward as part of scientific management may be just mentioned here, in order to leave to separate chapters the discussion of standards.

(*e*) *Records* are essential for two chief reasons. First, to show how things stand and what is being done; secondly, to aid in taking the long view by giving in summarised form results of the working over considerable periods, thereby indicating tendencies and showing variations due to changes introduced into the process. So far as Works management is concerned, these are data to the manager's hand; data useful also to the heads of departments. There is, however, always some danger of records becoming too retrospective. What seems to be needed is to magnify the importance of the Records Department by placing in it at least one official who has an eye upon the process as a whole and an adequate knowledge of the significance of what is recorded. The Records Office is, by its very nature, a feeder to the manager's office.

(*f*) *Despatching* is but a name for the perfecting of routine by forethought and planning; it is detailing the operations in advance and working to time. There is something in a manager being able to point to a sheet or set of sheets and say, "That's our time-table for to-day." Such a time-table will not all be of his own drawing up. Each department will have its own time-table, and there will be, as the efficiency engineer would urge, a planning department where all will be dove-tailed and co-ordinated. In some cases, as in a chemical works, one operation depends upon and even has to wait for another. Under such conditions, the economy of planned operations and of work ticked off as more or less per schedule time is self-evident.

Undoubtedly this notion of despatching and the advance planning it involves imply a considerable amount of additional office work. The McKillops (after referring to the preference many have for employing additional machine-hands rather than additional clerks) tell of a plant that was in a bad way. It had a hundred men in the shop, and six in the office. The concern was reorganised with seventy-five in the shop and twenty-five in the office; and has since done well. This is given as probably an exceptional case; but it adds weight to the efficiency advocate's plea for more detailed planning and recording.

CHAPTER IV

STANDARDISED CONDITIONS

"*It is a strange irony, but no small compensation, that the making of weapons of destruction should afford the occasion to humanise industry.*"—D. LLOYD GEORGE in his Preface to Miss Proud's book, "Welfare Work."

"*It is certain that, unless our industrial life is to be guided in the future by the application of physiological science to the details of its management, it cannot hope to maintain its position hereafter among some of its foreign rivals, who already in that respect have gained a present advantage.*"—From the report of Sir George Newman's Committee on Fatigue in Munitions Works.

"DURING the nineteenth century the average employer in his efforts to lower costs centralised his attention upon buildings, equipment, machinery, and methods. Near the close of the century, a few more enterprising employers had their attention attracted to the human element, the most important factor in production, and this attraction is the beginning

of a new science of business, the science of efficiency, which is a secure and sound foundation for further growth and greater industrial progress. It is astonishing that it was hardly more than a quarter of a century ago that employers realised that men and not money were the determining factors in commercial and industrial undertakings. . . . This factor, so long neglected, has come into prominence as the one to be depended upon to lower costs, make possible successful competition, and pave the way for greater industrial growth and expansion. Machines depend for their output upon the labour attending them, and the worker does the real work of industry. Why should he not be studied to ascertain, as in the case of machines, if wastes exist, or if better methods can be devised for doing work, so as to increase the output with the same physical and mental exertion? Economic necessity . . . drove manufacturers to pay attention to the human factor . . . in order to devise methods of lowering costs."

This quotation, conveniently summarising the history of the origin of scientific management, throws into relief both the promise and the peril of the new methods of organisation we are now to consider. Were we to read no further we might jump to the conclusion that the plan was one for making profits at cut-rates brought about by competition at the expense of the flesh and blood of the worker. Everything turns upon the purpose and spirit of the study of the human factor; and the extent to which, applying the "long-view" principle to industrial man-power, the really human aspect of the matter is considered. This author, whose point of view is that of the student of political science,* after quoting the opinions of manufacturers concerning the loss on the score of human efficiency, claims justly that "it is a dollars-and-cents proposition." But we must read further in order to know the true meaning of the words, "the human factor." Then we read of the "conservation of workers," and that "the most valuable possessions of a workman are his health, strength, and intelligence," and that "the prolongation of working life and the prevention of disease are problems which affect every employer." This puts the human factor in its true light. Improved working conditions, health considerations, the lengthening of the working years, together with the adequate remuneration of the worker—even as matters of business economy—belong to any movement towards higher efficiency.

The point scarcely needs enforcing. As Dr. Lee, professor of physiology in Columbia University, says, in his introduction to Miss Goldmark's book: "Try as we will, we cannot get away from the fact that so long as machines need men, physiological laws must be reckoned with as a factor in industrialism. . . . Much remains to be discovered, but enough is already known to make clear that such knowledge ought to be applied to the rational industrial procedure of the future. There is nothing more pathetic than to see an employer disregard the laws of physiology, use his helper to the breaking point, and then cast him aside." Even in a rapidly populating country like America it is not wise (and assuredly not human) to trust to fresh immigration to make good this loss. And certainly in no country is industrialism on anything approaching the right lines if of large numbers it can be said that they are "too old at forty."

Among the points to be considered in any reconstructional effort for the conservation of the health and efficiency of the worker are (*a*) the nature and cause of fatigue; the effects of monotonous labour; the causes and effects of periods of special pressure. These considerations affect primarily the worker himself. (*b*) Almost as intimately associated with him and his welfare are the conditions of the environment in which he works. (*c*) And no less directly is he affected by the mutual attitude in which he stands to those with and for whom he works, and they to him.

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* N. A. Brisco, Instructor in Political Science in the College of the City of New York, in "Economics of Efficiency."

(A) *Fatigue ; Monotony ; Over-pressure*

First, then, as to standardised conditions which shall lessen the effects of (1) fatigue, (2) monotony, and (3) special pressure.

(1) *Fatigue* is defined by Dr. Stanley Kent in a report to the Home Office in 1916 as "a diminished efficiency of the organism occurring after labour and partly dependent on it." Mr. C. K. Ogden* defines it as "a diminution of the capacity for work which follows excess of work or lack of rest, and which is recognised on the subjective side by a characteristic sensation of malaise." Specific causes of fatigue with which a more scientific management might deal are still under investigation; but certain of the effects and causes are familiar. Amongst the effects are a lessened output; a lower quality of work; and accidents, which appear from certain statistics to be more frequent during the hours when the worker's energy is becoming exhausted. Amongst the causes are long hours; the constant strain of working under a wrongly-inspired supervision; and the strain of work carried on under conditions not allowing for physical recuperation.

Remedies are of two types. They are either self-applied on the part of the worker, or they are devised by the management. The rate of the restoration of energy will depend, as Dr. Kent points out, upon the worker's physique and fitness; his food and digestion; the number, length, and character of the rest intervals; and the constancy of the worker's application. Over the third of these, the arranging of appropriate rest intervals, the management has direct control. It has indirect control over the other three. A due consideration of Works hygiene will certainly go far to affect the physique and fitness of the worker. Arrangements for preparing and eating food on the Works will affect its digestibility. And even the constancy of the worker's application and the fatigue thence arising will be influenced by every effort made on the part of the management to increase the interest and spontaneity of the work.

The self-applied remedy of defensive relaxation is very largely a natural adjustment of the worker to his work. Wherever there is continual strain, and no arrangement is made for rest intervals, this adjustment is the only one which can be immediately applied. Heavy manual labour has to be deliberate, or to be interspersed with periods of rest; otherwise, it could not go on. Dr. Kent reported that what looked like a loss of time was very often a necessary pause for rest. If, then, a body of workers have to strike for a recognised interval of relief from heavy toil, does it not show how much we may have to learn? Happier and better for all concerned is a recognised rest interval than resting, whether or no, followed probably by unwelcome

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* *Nineteenth Century*, February, 1917.

remonstrance from a foreman whose duty (more or less wrongly assigned to him) becomes one of driving.

In addition to improvements in factory hygiene and in the spirit of the work, a direct remedy which the management may apply is to institute pauses. The case of the pig-iron handlers has already been quoted. Another case is that of girls whose work was folding handkerchiefs. They had been engaged on piecework with no fixed pause except for lunch. After the rearrangement of the working conditions, not only was the output three times as great, but the girls were less tired. The rearrangement consisted: first, in standardising the conditions, the table on which the girl worked being raised to a height which reduced to a minimum the effort of reaching to and fro; secondly, in standardising the operations by arranging the handkerchiefs in suitable heaps—not folded; being handled; checked and parcelled: thirdly, in the instituting of pauses. Each hour was divided into ten six-minute periods. For the first twenty-four minutes, i.e., four periods, the girls sat, resting one minute in every six; for the next two periods, i.e., twelve minutes, they stood; for the next eighteen minutes, i.e., three periods, they worked as they pleased, for the last six minutes of each hour they did no work at all but anything else they liked (excepting immediately before lunch and at the end of the day, when they worked up to the end of the hour).

A further example is that of the bicycle ball testers.*

The physical necessity for intervals of relief is so self-evident that is it remarkable that instances, like those just quoted, should be the exception and not the rule. It is almost astounding that bricklayers repairing flues heated to a high temperature should have to take it into their own hands to secure breathing space and to protect themselves against complete exhaustion. Yet, in known instances, men resting under these conditions are quite liable to a foreman's remonstrance.

When the effects of continued overstrain are remembered, one is not surprised to read that "fatigue can become a form of social disease." We may have, and actually do have, strike epidemics. This "social irritability" is the more readily accounted for when we remember that psychological causes and effects run alongside the physical. Yet the fatigue itself is essentially a matter of wear and tear of cell and tissue. If accidents arise, or if the quality of the work is lowered, through the diminished power of concentration and attention, the ultimate cause is physiological. It means that the brain cells are starved of their nourishment; just as a diminished output will follow from muscular exhaustion.

(2) Closely connected with the question of

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* *See* page 70.

fatigue is that of *monotony* which has been defined "as a wearying uniformity." Here, however, the psychological factor counts for more. For there are some who constitutionally prefer the bee line to the mountain path, routine to change.

With the use of machinery, monotony cannot be avoided. The idealising faculties of a man who puts 5,000 shoe-uppers through a trimming machine in a day, have not much chance of play during working hours. Expert manipulation, rapid mechanical movements, and close attention are called for. So too, the tending by women of machines advertised as working with "bewildering rapidity" must be monotonous. The effects are both physical and mental; and, though there may be in each case a kind of organic adjustment, remedial or preventive effort is desirable whenever possible.

(*a*) Periodic change of task has been adopted in some cases, e.g., in Germany, with good results. This perfectly natural remedy not only has the advantage of widening the worker's outlook, but making him transferable from task to task may add to his industrial efficiency. As to the wisdom of the relief itself, it is well known that we may suffer worse injury from a constant use of the same nervo-muscular tracks in a "light job" than from much heavier work that is more varied.

(*b*) An intellectual (at any rate, an intelligent) interest may be given to the work by an adjusted earlier education and by the application of what

one may call instructional leadership on the spot.

Miss Goldmark dreams of a time to come when "means may again be found for the play of individuality in work"; adding: "Industrial training tends in this direction by giving some perspective, and teaching the relation of circumscribed tasks to wholes of which they are parts." Miss Jane Addams, though writing in a somewhat idealising strain, holds the same view.* She writes: "A man who makes year after year, but one small wheel in a modern factory, may, if his education has properly prepared him, have a fuller life than did the old watch-maker who made a watch from beginning to end. It takes thirty-nine people to make a coat in a modern tailoring establishment, yet those same thirty-nine people might produce a coat in a spirit of 'team work' which would make the entire process as much more exhilarating than the work of the old solitary tailor, as playing in a base-ball nine gives more pleasure to a boy than that afforded by a solitary game of hand ball on the side of a barn. But it is quite impossible to imagine a successful game of base-ball in which each player should be drilled only in his own part, and should know nothing of the relation of that part to the whole game. In order to make the watch wheel, or the coat collar interesting, they must be connected with the entire product—must include fellowship as well as the pleasures arising from skilled workmanship and a cultivated imagination." From a slightly different point of view and referring rather to the factory, Lord Haldane in his introduction to Lord Leverhulme's book, "The Six Hour Day," says: "The object should surely be to make the workman in the future more of a director of instruments than a labourer. . . . Monotony will at least be diminished when men feel that they have always to be thinking when they act."

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* For the reference and context, *see* page 90.

(*c*) Another natural remedy is the shortening of working hours. This is already in course of being applied.

(*d*) A further and very important expedient, one, indeed, which is preventive rather than remedial, is a more careful selection of workers for their tasks, according to their physical and mental fitness. Close observation confirms the view that montony is far from being as monotonous to some as it is to others. Mr. C. K. Ogden, in the article quoted, warns us against the loose use of the word "monotonous.'' Some types, he says, seem actually to prefer work that is uniform and repetitional. Münsterberg, similarly, as a matter of psychological investigation discovered that those who perceive the repetition least hate it most, while those who have a strong perception of uniform impressions, even to the extent of overestimating their number, are the ones who, on the whole, welcome repetition in

life. For the latter, evidently, a repeated experience has a higher mental value than for the former, and has accordingly a readier welcome. Different individuals, again, differ in their tendency to "temporary exhaustion of psychophysical dispositions"; some after having received an impression being unable immediately to seize the same impression again, others apparently finding in the experience of an impression a kind of inner preparation for a similar impression. This latter type stands out as self-selected for repetitional work. Mr. Ogden, nevertheless, names two things which are to be guarded against: first, "the helpless feeling of *being driven* by a combination of great frequency and great regularity of recurrence"; and secondly "*lack of interest* through the absence of intelligibility or purposiveness in the work."*

We may still have skilled workers on routine jobs. We may select those of routinist type; and in this case we lose nothing by giving them a wider vision; and, in the case of the non-routinist type of worker on a repetitional job, we may do not a little to remove the feeling of monotony by implanting an interest.

After assuring himself by observation and experiment that variety may often be present which escapes the casual onlooker, Münsterberg made a search for the most monotonous jobs he could find. At one factory he found a woman whose duty it was to wrap up incandescent lamps in tissue paper. She had worked for twelve years at the rate of about twenty-five lamps in forty-two seconds. Each operation included about twenty finger movements. She told him that she found the work really interesting, e.g., in thinking how many boxes she would be able to fill before the next pause; also that there was continual variation, the packing sometimes not proceeding smoothly, or she herself being fresher at one time than at another; and that she varied the way in which she grasped the lamp or the paper; so that there was always something to observe and to think about. Making full allowance for any idea the woman may have had that she was supplying "copy," the testimony is significant. At another works Münsterberg found a man feeding an automatic machine for cutting holes in metal strips. He had simply to push the strips slowly forward, and only when the movement was not exactly true had he to stop the machine by a lever. This man had been making some 34,000 uniform movements daily at this job for fourteen years; and though he gave Münsterberg the impression of being an intelligent workman, he asserted that he found the work interesting. At first the work was fatiguing, but as he went on he liked it more and more. He still had to fix his thoughts entirely on the work in order to earn his

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* For comments on this point, *see* Chapter VI; the Appendix on the Junior Technical (and other types of) School; and paragraph (*b*) immediately preceding this.

piecework wage, but declared that he found real pleasure in the activity itself. On the other hand, Münsterberg came across workers whose activities were really varied and interesting in character, who complained of monotony. He concluded, therefore, that monotony depends more on the individual than on the kind of work: a conclusion which emphasises the value of a right selection of workers.

(3) A third condition affecting the health and general efficiency of the worker, is the fluctuation of *pressure*, periods of stress being followed by periods of comparative stagnation. One object in view in standardising working conditions would be to average the pace, and as far as possible to eliminate overtime and Sunday work. "Of all welfare work in factories," says Lord Leverhulme, "a proper apportionment of the time is the one that will yield the best results, and is the problem most pressing for solution."

So far as overtime is concerned, does it not assuredly mean that the body, already, one may suppose, sufficiently exhausted with the day's work, continues to endure industrial strain? Experiments with the ergograph point to the fact that, as would be anticipated, effort increases with fatigue. During prolonged periods of overtime the worker comes daily to his work, unrepaired. "Fatigue let run is a debt to be paid at compound interest."

As far back as 1893, a British inspector, challenging the wisdom of this short-view device, said: "I am afraid that foresight and arrangement will never be exercised while the mischievous expedient of overtime is made so easy." In pointing out its evils to American readers, Miss Goldmark emphasises the familiar fact that overproduction is one of its direct results; this, as we all know, being followed by spells of bad trade.

Overtime may often be avoided by spreading work more uniformly over the year. The manager of a small dye works in Lancashire has told the writer of a method he adopted. He had on his works good storage capacity; this enabled him to go to a big yarn manufacturer and to ask him to supply him with yarn in lines running regularly throughout the year, so that he could handle it as opportunity came. In this way, when special orders were run through, he was able to turn his men on to standing work.

The question of overtime in shops is largely a consumers' question. At the time that she wrote her excellent monograph, Miss Goldmark had been for five years president of one of the committees of a National Organisation of Consumers' Leagues, operating in about a score of the States. In default of a law prohibiting it, customers, having in view the welfare of women and children workers more especially, made a dead set against Christmas overtime. The best New York tradesmen responded, closing early in the evening during the last half of December, without suffering financial disaster. Many customers, as well as shopkeepers, are hoping that the early closing which has become a custom in war time may be made permanent.

Dr. Kent is equally emphatic with regard to Sunday labour. He points out in his Home Office report that in normal times efficiency decreases towards the end of the week, and is only remedied by the Saturday afternoon and Sunday rest. The necessary sequel of Sunday work week after week, if breakdown is to be avoided, is "balancing," or adjustment of the expenditure of energy to compensate for the loss of the week-end rest.

(B) *Workshop Hygiene.*

The working environment, bringing in, as it does, Works hygiene in all its forms, is obviously of the utmost importance. Until it is considered, there can be no serious reckoning with the human factor in industry, and no really serious search for the conditions of efficiency. There have been instances of working conditions taken over as, so to say, part of the job which have had the gravest consequences; and which might have been very materially, if not wholly, remedied. Such conditions run quite counter to twentieth century standards, and to the social consciousness which has been quickened in a hundred different ways by the war. A chance for "joy in work" is part of its reward; and it is the natural accompaniment of joyous work that is suited to the worker and that is carried out under right conditions. It implies, as an average condition, an environment sufficiently supplied with air, light, and warmth, and of such cleanliness and general sanitation as is compatible with the rough-and-tumble processes of manufacture. There is a kind of exhilaration in "roughing it," when the conditions are such as to maintain bodily energy in sufficient vigour. Factory hygiene is the science of standardising working environments at least up to this point. Ventilation, lighting, space, warmth, cleanliness (especially in sanitary arrangements), are aspects of it; effects of smell, and even noise, are justly included by Dr. Kent.

(C) *Atmosphere and Perspective: the Works Spirit*

It is not necessary, after what has been said in earlier pages, to add much concerning the standardising—at no mean level if it is to yield the best results—of *the spirit of the industry*, especially as affecting the relationship set up between worker and worker (of whatsoever grades) and between worker and work. The very existence of ideals of industry—who can fail to trace them in the connection between the cottage fireside and the miner's toil?—justifies the expectation of a certain human pleasure in true work. This would follow under the conditions enumerated in this and the succeeding

sections; and one of these conditions is the realising that every man's best, and the whole of his best, is wanted and valued. "If you get a glimpse of a good thing, let's talk about it." A man so addressed knows that store is set by him as a thinker as well as a worker. "I want," said Mr. Lloyd George in one of his recent and most happily-inspired speeches, "the workman to contribute of his sagacity and practical experience to the smooth and successful working of the concern in which he and his fellows spend their lives." Judging by recent symptoms the worker wishes it, too. The brains are not all on one side of the hedge.

Admitting that on neither side (if one must still speak of two sides) is a return to pre-war conditions advisable or even possible, an alternative must be found. In the place, for example, of the complete restoration of Trade Union conditions and as a preventive of bitter strikes and serious public disorder, Mr. Sidney Webb advises Government guarantees against unemployment, the maintenance of standard rates, and a due "share in the control of workshop conditions" by means of universally recognised workshop committees; in return for which the workers might be asked to "abandon all restriction of output, machinery, or the selection of operatives."* This reads like bargaining; and, doubtless, the give and take which are essential in any advance towards efficiency ideals will at first assume this form. But this will not greatly matter; so long as the spirit of the transaction is, and continues to be, bigger than the transaction itself; so long as the end that is steadily kept in view is a real co-operation, unification of life through conscious unification of aim.

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* **"Problems of Reconstruction: A Symposium" (Unwin).**

CHAPTER V

STANDARDISED OPERATIONS

"*When necessity dictates and the purpose is defined, British brains can project and act as scientifically as any.*"—MR. G. H. ROBERTS, M.P., in "After War Problems."

"*I am vividly conscious that the standards of efficiency of both employers and workpeople leave much to be desired.*"—ibid.

ONE readily passes from the question of working conditions to that of working methods. Standardised operations, though clearly distinguishable, are one form of standardised conditions. They affect the work itself.

In a perfectly general sense, the better the method, the easier and better the work. But individuality needs to be allowed for. Indeed this is one of the most controverted aspects of American "scientific management"; for it implies time-study (as we saw it applied in the case of Schmidt and his colleagues) and motion-study; and, carried to anything approaching an extreme, these may easily become but new ways of mechanising the worker in the name of efficiency, rather than setting him free and throwing open before him the way to his own best. The latter is the ideal; it has in it more of the long-view common sense, already spoken of. Teachers are sometimes told that there is no "average John." Similarly the workers, confronted with the results of stop-watch tests and movement studies, say there is no average worker; and, if there is any idea that the men selected for the time studies are a little above the average, they naturally say it with all the greater emphasis. It will hurt no one to be shown a handier way of doing his work—a way involving fewer and simpler movements. In some cases, it may be found after a fair trial to be less handy to the individual himself than his own way. But, in other cases, the "scientific" method may be highly advantageous, saving strength and labour, and contributing to efficiency and earning power. At the Japanese-British exhibition in London, Mr. H. L. Gantt, one of America's efficiency pioneers, saw a woman attaching labels to boxes at the great speed of twenty-four boxes in forty seconds. He showed her a new way. At the first attempt she did twenty-four boxes in twenty-six seconds. There was no more effort; only fewer movements. So with time studies. Referring again to the pig-iron handlers, time studies showed a potentiality of forty-seven tons, in spite of resting 57 per cent. of the time; whereas the average day's work had been twelve and a half

tons. The rearrangement of work and workers led to higher earnings by men suited to the work, and to a greatly increased daily output.

Even when the workers have been well selected, especially in cases where they are chosen rather on the grounds of potentiality and promise than of actual experience, there will often be need to vindicate the selection by training the worker in the best methods of doing his work. If the workman fails to do his task, says Dr. Taylor, "some competent teacher should be sent to show him exactly how his work can best be done . . . to encourage him and, at the same time, to study his possibilities as a workman." No large Works—may it not be taken for granted?—is without its experts in the performance of the various operations.

The standardising of operations covers practically the whole field. Every one works more or less to method and to programme. Efficiency is thereby increased; loss of time and fatigue are diminished. On the other hand, imperfect or haphazard methods lead to loss and confusion. It has been said that one cannot standardise the operation of the office boy who runs errands. But to a large extent one can. If he carries a sample, or instrument, or note, and leaves it where it may be overlooked; or if a sample should bear a label, and he neglects to label it or to see it labelled; or if he should speak to some one before performing his task, and fails to do so; the defect is either in the boy or in the standardising of his job; and it is not always the boy who is at fault. Again, if a new foreman comes on, and is left to find out how things are done or ought to be done, it being supposed that "some one" will have told him, the mischances that follow are the result of failure to standardise operations.

"Routing," i.e., planning the orderly passing of material from process to process or from hand to hand, is a form of standardising. At the United States Government arsenal at Watertown, Mass., for instance, where "scientific management" has been adopted, there is a "planning-room" for production of time-tables so that the pieces which travel through the various shops, from raw material to finished product, shall do so without unnecessary delays or the congestion of work at particular machines.

In easing and expediting certain operations, a comfortable and natural attitude counts for much. Sorters have suffered greatly from having to work in strained or uncomfortable positions, sometimes at tables so high that they had to stand all day (when they should have been seated); sometimes at tables so low that they could not get their knees under them. The handkerchief folders found great relief from the adjusting of the height of the tables they worked at. Similarly, typewriters at one's own suggestion have found real relief from eye strain, and from the chest-effects of stooping over the manuscript or shorthand notes they were transcribing, by sloping their manuscript at the side of the machine, so that the keyboard and the copy were almost on a level.

Having spoken of fatigue as a cause of inefficiency, we now see that it may be *an effect* or a sign of inefficiency. "Tired often all day, tired, not from excessive work, but usually from wrong methods and habits of work; a chronic, 'living at the tips of one's nerves' . . . too often the home, school, the workshop, the office . . . are in the hands of tired people showing all the signs of nervous fatigue and the resulting irritability." One comes across the argument sometimes that acts of decision should be eliminated. This would go too far if it meant putting thought and will out of action altogether. But certainly one does not want to be always making up one's mind about things that are decided already. To rush round for (or to work out afresh) results that ought to be at hand is the kind of waste, and wantonly causes the fatigue, which system, method, and the availability of records may prevent. System in details sets the mind free to decide, when matters that are really worth while claim its attention.

The standardising of operations is thus the application of order—that "first law" to which men instinctively respond. One may work systematically, and yet freely; indeed, the more freely, because systematically. We fall naturally into step with a marching squad. So, ideally, may a whole concern, working according to plan, be actually in line with each individual worker's own tendency, "appealing to the individuality of the man, of the worker," through its harmony with natural impulse. Planning tends to rule out driving. In this and in every way, "planning pays."

CHAPTER VI

STANDARDISED TASKS—CONNECTIVE NOTE ON THE SHOP STEWARD MOVEMENT

"*Industry is evidently creative of character. The occupations in which a man spends most of his waking hours, and the return which he gets for his work, are more powerful determinants of the quality of his life than almost any other influence. . . . What is questionable is not the fact but the direction of its influence on character. It is here that modern forms of industry present their deepest problems.*"—"Social Purpose," by Messrs. Hetherington & Muirhead. 1918.

Employers "*have succeeded in organising themselves* against *labour; they have now to learn to organise themselves* with *it.*"—J. H. PARSONS, *in* "*Mind and the Nation.*"

HAVING introduced the chapter with such pregnant utterances, it will be well to commence with an account of an actual experiment, which was successfully carried out in the small dye works in south-east Lancashire referred to in an earlier chapter. The tasks were standardised, i.e., the amount to be done in a given time determined beforehand, by the manager planning the week's output in advance in terms of the quantity of yarn to be dyed by each shift, the quantity varying, of course, with the quality and the colour of the material to be turned out. Each shift being made responsible for a given output, the detailed work was apportioned each week by the shift foreman and the leading hands (two on each shift who were elected by the men themselves, and who acted as workmen representatives or delegates). Each shift was responsible also for leaving all machinery, as well as the work in progress, in such a state as to help the on-coming shift to attain their output. This co-operation between shift and shift was obviously to the advantage of the firm. It was also to the advantage of the workers, owing to the pooling of wages; each man, that is to say, received the same money for the week's work on whichever shift he was engaged. There was, in addition to wages, a bonus for output beyond the week's quota.

The manager (who was the employer's son) seldom had to persuade the men to work. A man often gave another a hand, if his own task slackened and the other was pressed. Whereas, if under different conditions the employer had come up and asked him to turn from one task to another in this way, the answer would have been, " Well, I'm on this job, and am not going to do that job as well "—an attitude really satisfactory to neither. More than this, the manager told the men that so long as they got the work done they were at liberty to agree

amongst themselves on hours,* e.g. they might knock off earlier on Saturday. This they did, finishing at 11.30 a.m. instead of 1 o'clock, which was the ordinary time. Any loss of time was averaged over the shifts, excepting when due to the employer's failure to supply the necessary materials, in which case loss of time was compensated for. On the other hand, bad work due to careless workmanship had by the very nature of the agreement to be made good by the men themselves. All these matters were far more easily handled owing to the recognition of the leading hands, who, with their shift foremen, dealt with complaints concerning individual slackness.

When new machinery, designed for labour-saving, was introduced, it was explained to the men, and terms were adjusted when necessary. New processes were worked on time rates until perfected, and costs discussed with the men's representatives in order to arrive at a fair working basis. In case of short time being worked, the workers themselves fixed their own rota, and undertook amongst themselves to provide the requisite number of workers. The management was chary of dismissing a worker for a fault in his work or behaviour; it was thought better to take a little pains in showing him his mistake than to bring in a new man who might make the same mistake almost at once. In all cases of difference, full data were, as far as practicable, placed before the workers; a misunderstanding in this way not unfrequently leading to a better understanding.

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* Even the time of taking their holidays was arranged by the workers amongst themselves. All that the management did was to assign the amount (the fourteen days per annum prevailing in the district). Enough men were always left at the Works to carry on.

The wages rate was a piece-rate proposed to and accepted by the men themselves, the bonus being paid quarterly or half-yearly by arrangement. The preliminary to the men's acceptance of the piece-rate offered, which exceeded Trade Union rates,* was a frank talk between them and the manager as to costs of material, costs of running machinery, and the like. With the help of these data, the problem was put before them point blank: "If you were yourselves running these works on co-operative lines, you would require a working basis." Agreement as to hours and wage-rates followed; and on the basis arranged the men were satisfied that the employer was entitled to his share; the employer was satisfied that the men were entitled to their share.

The point of this illustration is that it was something more than a cash consideration which made the men willing to pull together with each other and with the management. The viewpoint of the latter was that the men had brains as well as the masters, and that only

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* Some of the men were members of their trade union, some non-unionists.

good could come from interchange of ideas and a frank mutual understanding.

To take a second illustration, from a chemical works engaged during the war in making certain crystals in quantities up to 1,500 or 1,600 tons per week. (To meet the mind of the up-to-date manufacturer, it must be admitted that the process was a rather antiquated one, involving the use of large evaporation pans.) One of the shift managers was always urging that it was possible to standardise the output. When he came on, he would go round to the charge-hands on certain pans and, whatever the condition in which they found the pans, would say to them: "Now, it's to be four inches an hour!" "Yes," might be the reply, "and as much more as we can get." Elbow-to-elbow leadership always counts. "Never mind," the manager would say, "get more if you like, but I want a standard of four inches an hour." He got it. In this instance, there was a not very high-spirited competition between the three shifts. Had there been co-operation, the output, with less difficulty and with far less friction, might easily have been six inches an hour.

It would not have been possible to write briefly about the standardising of tasks had not the standardising of conditions and operations first been touched upon. In addition to these, there is at least one other pre-condition, namely, the selection of workers. If tasks are to be standardised, as was the case with the pig-iron handlers, from the standpoint of the first-class or "high-priced" man, obviously there ought to be only such men at each particular job.* No one, however, can expect organisation to reach any such point of perfection as this; not even if the world could supply, provided the right job was found for each, none but first-class workers. After a more or less haphazard selection of workmen, it would clearly be a merciless speeding-up policy to adopt as a standard the working capacity of the first-class man. The widely experienced difficulty with regard to piece-rates illustrates this. Even on piecework—anomalous as it may sound—men do not work their hardest, lest they should thereby unduly raise the standard of task per unit-time against themselves and their workmates.

By averaging from actual experience, or by investigation and experiment, a fair estimate of output and of task-power can be arrived at and be jointly agreed upon by management and workers. Data may be procured, doing away with any necessity for blindfold bargaining. This might be said to be one of the commonplaces of good management. But "scientific management" aims at higher efficiency levels. It has in view a maximum efficiency point. And for this to be attained all the conditions we have been considering must be brought into the account. First, operations must be standardised; that is, taking standardised conditions for granted, an effort must be made to secure that the work should be done by the simplest and easiest method. And, secondly, the work must be done, task by task, by those who have been selected as physically and mentally the best fitted for it. Schedules may well be a clumsy misfit in the absence of any care in the selection of workers. "The schedule must fit the man, and the man the schedule." It is certainly not difficult to see that production may be greatly increased and considerably cheapened by adequate care in the selection of workers. If amongst linotype operators, for example, some with the same amount of effort can do double the work which represents the less efficient operator's maximum, the employer's advantage (and the advantage of all employers of linotype operators, collectively) would be served by testing applicants for apprenticeship. Supply steps in to meet a realised demand; and to-day there are springing up, whether as apprentice masters or officials otherwise assisting in works management, those who have the practical psychologist's knack of judging capacity and aptitude; industrial potentiality often depending far more upon the "make" of the candidate than upon his outward history.

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* Another interesting example may be taken from Dr. Taylor's experience. He was called in to systematise the work in the largest bicycle-ball factory in America. Amongst the workers were girls whose duty was that of inspecting the balls; they were somewhat skilled by experience, as the company had been running from eight to ten years. They worked ten-and-a-half hours a day, half-day on Saturday. Their method was to place a row of polished steel balls on the back of the left hand, in the crease between two fingers pressed together, rolling them over in a strong light, and with the aid of a magnet picking out the defective ones—dented, scratched, fire-cracked, or soft. Only a trained eye could see the minute defects, and the strain was considerable, though they worked seated. The day was shortened; and it was found that in a fortnight the girls could do the same work in ten hours, being paid at the same rate. After selecting the workers, the hours were reduced to nine-and-a half, nine, and eight-and-a-half successively, without decrease of wages, and the output actually increased with each shortening of the hours.

In bringing about this change, laboratory tests were made use of, which proved that there are some who perceive quickly and react slowly, some who, also perceiving quickly, react quickly. Other things being equal, the latter was the type for bicycle-ball inspection. Some of the most intelligent and trustworthy of the girls had to be removed to other work. In addition, over-inspectors were appointed to safeguard against risks of rapid work. (Traps were set occasionally, defective balls of known number being put in beforehand.) Records were kept of each worker's results. A wage stimulus was added. Conditions were set up so that fatigue was guarded against as far as possible: it was found that after an hour and a half the girls showed signs of needing rest, so a ten-minutes interval was instituted at the end of each hour and a quarter, the girls being obliged to stop work and allowed to relax in any way they wished.

The final result was that thirty-five girls did the work formerly done by 120, and that the accuracy of the work (showing the paramount importance of rightly-chosen workers) was two-thirds greater than at the former slow speed.

The standardising of tasks requires for its full application, as an "efficiency engineer" has said, an infinite knowledge. None the less, standards have to be made; and the more carefully they are considered the more likely is efficiency to follow. If it is "a truism" that trade life in America is shorter than in countries

where the pace is slower we have an actual instance of what may justly be described as a "killing pace"; and America needs to face the problem of standardised tasks. If, again, Britain's captains of industry follow Lord Leverhulme, when he "trusts that the foremen of their departments will solve the problem of how to produce better results out of six hours a day at no less than the wages now in operation," it will be essential to pay full heed to this principle of the standardised task. Management and workers alike must know what, granted the right conditions and methods of working, is the fair average output per man per hour at each job.

CONNECTIVE NOTE ON THE SHOP STEWARD MOVEMENT

Following upon this threefold consideration of standards—conditions, operations, tasks—a word is desirable as to the machinery of intercourse between management and workers in setting up, maintaining, and revising standards. And it may be taken for granted that the most direct and sure way is not to create a new organisation, but to turn to its fullest use any organisation which has arisen spontaneously. The management needs a way of reaching the men through their own agents, who will speak to them in their own voice. The soul of Prussianism was dictation backed up by threat or force. Its fate is sealed. And our peace ideals must be in keeping with our war ideals. Our comrades and their sons have fought, many will carry all their lives the scars of honourable sacrifice, and many have died to make the world "safe for democracy," and the democratic armies have won the day.

Democracy, therefore, must come. Is it not the policy of one and all to recognise this, and to ease its way? There was a sugges-

tion of the way in which this end may be attained industrially in the example given at the commencement of the chapter. The leading hands were very much in the position of "recognised" shop stewards. The value of their service both to employer and employees was that they were on the spot and could take up matters concerning that individual Works. On a large scale, when industrial procedure and trade union customs were set aside to meet the imperative war demand, it became "necessary to find some way of bringing to bear on the new situation the point of view of the man at the bench." An extension of the number and the duties of shop stewards, elected by the workers in each shop, and the appointment of Works Committees, composed of the shop stewards of a Works acting collectively, were the means spontaneously resorted to. Spontaneous movements always have vitality; they have in them something of the indelibility of instinct. If, as many wish, there could be a clear understanding between shop stewards and works committees, on the one hand, and the Trade Union branch for the district, on the other, trade unionism itself would be made more articulate and more adaptable. And if the employers, on their part, *recognised their own men*, according to their representatives the right of approach to them (with, in important matters, the endorsement of the Trade Union), management itself would be more real and direct, and the relationships between management and worker would be vastly improved.

That the shop steward movement is not merely a blind reaction, but has a definite and constructive aim, is shown by the statements of its supporters. It is known that the movement *with its present aims* was already astir before 1914. Its policy is that of a *workers'* movement; in part self-educational, in part propagandist. Its spirit is, in the far view, constructive. May not the nation's wisdom consist in reducing the far view to the near view? Here, at any rate, are two sentences taken from an article written by an active worker in the movement: "The worker wants the means of a free, cultured, and dignified life and a share in responsibility." "There will be no stability or lasting peace in industry until the motive of national service is substituted for the present motive of private gain." Nationally speaking, we may be a long way from the ideal condition of things in which "all are for the State"; and in which industry's main impulse is the common weal. But this is the new spirit in industry of which we are witnessing the day-spring. There may, and doubtless will, be many intervening steps before that point is reached; but the earlier and the ampler the recognition that a nobler day for mankind is dawning, the easier will be the transition.

At any rate, the shop steward system, whilst

maintaining its integrity as a workers' organisation, offers employers an opportunity for recognising the Trade Unions in the individual workshop as well as outside. History is being made rapidly. We have in a general sense passed from the time when the employer's objection to Trade Unionism was that he wanted to deal direct with his own employees, to a time in which employers, through their Federations, want to deal with Trade Unions. Is not the golden mean between these extremes now within reach? Here is a body of workers' representatives ready to hand, quite capable of working in co-operation with the local Trade Union officials; offering the employer, therefore, the advantage of dealing with his own employees under Trade Union auspices. The new effort, (in favour with some far-seeing employers, supported by the Ministry of Labour, advocated two years ago* by the improvement of conditions adviser to the Munitions Ministry, Mr. Seebohm Rowntree) to set up joint councils or committees of employers and employed on each Works, will without much doubt find its best furtherance by including the shop stewards committees as part of its policy. It is an hour of bridge-building: and the stays need to be made secure on either side; for the strength of the stay on either side is the strength of the whole bridge.

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* *Nineteenth Century*, February, 1917.

CHAPTER VII

Efficiency Rewards

"*Trade Unionism should make labour valuable.*"—Mr. John Mitchell, one of America's foremost labour leaders, quoted by N. A. Brisco in "Economics of Efficiency."

"*Increased output is the only way in which the wages standard can be raised.*"

The subject of a direct reward of efficiency, as distinguished from a standing wage without regard to output, is too large to be discussed in the course of so rapid a survey as the present. Yet the reference cannot be wholly omitted.

Of course, the reward of work is not purely a question of wages. A man's joy in life and his joy in his work are part of his reward, as well as his actual earnings. And all three rewards should follow from higher efficiency.

(*a*) Speaking of the six-hour day, which must of necessity be an efficiency day, Lord Leverhulme holds in view the enrichment of the worker's intellectual and social life. He sketches a scheme of education which is almost Platonic alike in scale and in its prescriptiveness, the end

of which would be to make life more worth living by men endowed with heart and brain, each with its native hunger. The opportunity for this fuller living is part of the reward of the efficiency which a six-hour day implies. Between the ages of 14 and 30, two hours daily, Lord Leverhulme suggests, might be given to an education having as its object bodily and mental development, the completer unfolding of the worker's personality: from 14 to 18, an education based on that of the High School, along with physical training; 18 to 24, an education on the lines of Technical School or University, with extended physical training; 24 to 30, training for national service and for the duties (official duties if elected to them) of citizenship.

Even on lines less educationally ambitious, there can be little doubt that the true enjoyment of life would tend to be enhanced by the shorter working day which higher efficiency might make possible. "As a matter of fact," Miss Goldmark asks, "what has been the effect on working people of increased leisure? The answer is one of the most encouraging chapters in industrial history. . . . The gradual emergence of the English mill operatives from the physical and moral degradation into which they had sunk in the thirties of the last century, is not exceptional but typical. It is a humble chronicle, but full of meaning to any reader who loves the fullness of human nature. Gardening, sewing, the out-of-doors on summer evenings, evening schools in winter" (to which one may add the introduction of music into the home), "time for the 'endearing trivialities of home life'—these were some of the simple, yet enduring, things at which mill workers learned to spend their leisure." Moreover, there has been a great increase in temperance; for "drink is the resource of physical debility."

(*b*) Joy in work will come as a result of various co-operating causes.

One of these causes will be the greater freedom, the more liberally encouraged self-direction, of the worker. One ounce of persuasion, said a Works manager recently, is worth a ton of force. Many strikes in recent years have been caused by the workers' sense of being driven, owing to the disciplinary methods of which they have in some places had experience. There is need to leave the worker a little more room for personal "pride in a job well done, such as was enjoyed by the savage when he made his bow and caught his fish." A point that is still unsettled with regard to "scientific management" and its adoption of the detailed instruction cards which issue from the planning office, is whether they tend to remove initiative and the sense of achievement; or "whether the workers do not take a certain common pride in the efficiency of the whole of which they form part" (Labour Year Book, 1916). The answer, doubtless, depends upon the spirit in which the whole thing is engineered.

One of the culminating forms of efficiency reward would be the participation of the workers, not solely in the control of the conditions under which they work (which is to some extent within their power already) but in the control of operations and in the direction of the concern. The admission of workers' representatives on boards of directors, is far from being a new or untried suggestion.* Much might be gained both from the counsel which able workmen might contribute, and also from the consciousness of co-operation, all with each and each with all, which would result. A worker will have more pleasure in work in the direction of which, in the sense of management, he has representatively some control.

All the time, room must be left for, and even encouragement given to, the maintenance of good feeling amongst workmates. The more collective, and so to say, public the recognition of efficient service, the more acceptable and provocative of good feeling is it likely to be.

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* Dr. Charles Carpenter, Chairman of the South Metropolitan Gas Company, tells in "Industrial Co-partnership," of the boards of two companies of which he is a director, on which, in one case, three, and in the other case, two, directors, are elected by the co-partner employees. "Every one has a chance one day to be associated with the management; and of those who have been chosen during the fifteen years over which my experience extends, I can unhesitatingly say they have been in every way a credit to themselves and to those selecting them."

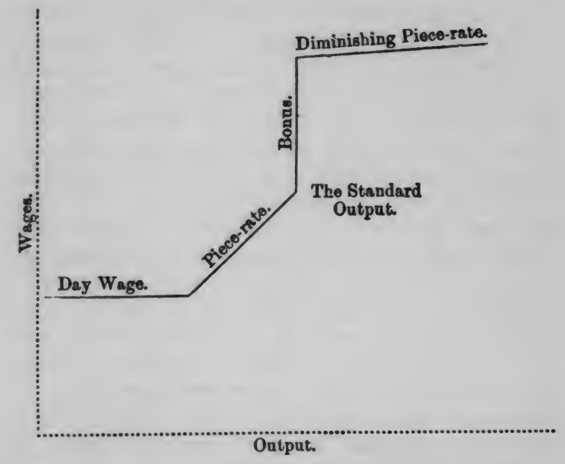
At Raceview Woollen Mills a plan has been set on foot whereby the Ordinary Shares are divided into "A" shares and "B" shares, the latter to be held only by weekly wage-earners, who will elect one of their number as a director—more when their total capital holding justifies it.

(c) Efficiency is a *sine qua non* of maintaining a higher wage-remuneration.

The difficulty from the employer's point of view in fixing a high standing wage is that there are inefficient workers, whose labour does not actually earn a high wage. Although Mr. G. H. Roberts says that Trade Unions do not make it their policy to uphold inefficiency, and that employers are not compelled to employ the inefficient, this is a real difficulty, none the less; and the variety of the devices proposed to meet it points to the difficulty of the problem.

Broadly speaking, the tendency is that "every time we increase the output we have a fund out of which we can increase the wages." This relationship between output and wages is allowed for in any scheme which aims at a reward for efficiency.

The following curve shows the Labour Annual (1916) summary of the wages scheme, under "scientific management":



The day wage is a flat rate, however small the output. Beyond this, the wage increases by piece-rate, as it approaches the standard. When the standard is reached, a bonus is paid. Beyond the standard, the piece-rate is on a diminishing scale. This is important, as it discourages unlimited speeding-up beyond the point "scientifically" fixed as the standard. But, sound as it is in principle, the diminishing piece-rate after reaching the standard is by no means universally observed. In some cases, there is an accelerating reward above the 100 per cent. or standard level.

The question one naturally asks is whether this wages scheme provides a living wage for the worker below the efficiency standard; if not, the marked leap upwards in wages at standard point discriminates rather severely between, say, the just efficient and the barely efficient worker. The common plan of making the efficiency reward begin at 62½ per cent. (sometimes 75 or 80 per cent.) of the standard allows for this, to some extent. If the reward begins earlier it gives a better chance to all of gaining a share in it. At the same time if, with the reward beginning at 62·5 per cent. (up to which point the flat day rate only is received) a man earns no reward, the man himself is forced to criticise his own performance. He may decide to try to change his job; or he may either improve his method or increase his effort so as to begin to share in the efficiency reward.

In the Ford system, the same amount is paid to all workers, and at a rate 50 per cent. higher than standard rates.* This gives the firm a disproportionate number of the best workers, as "high-priced" men are, of course, attracted. They are expected to do their work in the time and with the accuracy prescribed, which far exceed

ordinary working standards. It is, by its very nature, a policy possible only to a very limited number of firms, as there are not enough super-efficient men to go round. Also it requires most watchful and skilful management—the best answer to the question concerning Mr. Ford, junior, now manager of the Works, "Is a man worth £30,000 a year?" Time-study, planning, plant improvements, methods—all have to be kept at their most perfect pitch. The men could not be blamed if the organisation failed: so far the strain is on the management. There is always the implicit threat of dismissal if a man fails to reach the mark; and, in this respect, the strain is on the worker.

Independently of the methods described, other and simpler plans of rewarding efficiency may be just noticed. Good time-keeping has been found to be greatly encouraged by the offer of a full week's holiday during the year with wages paid, on condition that good time is kept. So far as industry and skill in work are concerned, the promoting of a highly efficient employee into a working "leading hand" or working "charge hand" has been found to answer to some extent the purpose of an efficiency reward. Leading hands may be graded, and in this way scope may be given for a progressive increase in the reward; or, a leading hand may be transferred to similar rank in a job that is more highly paid than the one on which he had been engaged.

Mr. Atkinson, whose helpful little book, "A

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* For an admirable summary of the meaning of scientific management in relation to methods of remuneration, *see* "A Rational Wages System: Some notes on the method of paying the worker a reward for efficiency in addition to wages," by Henry Atkinson, Engineer Expert to the Mixed Tribunal, Cairo, 1917. George Bell & Sons.

Rational Wages System," has been mentioned, suggests in an appendix a floating wage rate, or a variation of 6/- weekly above the Trade Union rate, for every class of worker. Every worker reaching 95 per cent. of the standard on the average of three months work would have a rise of 1/- per week for the next three months; and so on, by three-monthly stages, until, if the full progressive reward is earned, in 18 months the worker receives the full 6/- efficiency reward. Should such a worker afterwards fail on the average of three months work to reach 85 per cent. of the standard, he drops 1/- for the next three months; and, if this continues, in 18 months time he is back at the Trade Union rate. Should there be a general failure to retain efficiency earnings, something may be suspected to be wrong in the standardising of the job or in the conditions of working. A further clear advantage of such a scheme is that it operates automatically; no one can complain of unfair treatment or favouritism.

Labour opinion runs strongly in favour of a time-rate, pure and simple; and the opinion is accompanied by a certain shyness, the reasons for which need to be frankly considered, of "fancy systems." None the less, Mr. Allingham, who has himself introduced amongst those he employs the efficiency-reward plan, says in his preface to Mr. Atkinson's book, on the strength of his personal experience of the adoption of this plan in England, that, when it is approached

broad-mindedly by both sides, the worker has "nothing to fear and, indeed, everything to gain." One important proviso would have to be made, in keeping with such arguments as are urged by Mr. Seebohm Rowntree in his "Human Needs of Labour," that the minimum wage (or day wage) should be determined primarily by human needs and the amount of the efficiency reward by the value of the services rendered.

CHAPTER VIII

SOME POINTS OF CONTACT BETWEEN INDUSTRY AND EDUCATION

"*In the field of general education the lesson of Germany is the close adaptation of school organisation to the political and social ideals. No less intimate is the adjustment to industrial and commercial needs. For this branch of educational activity (and we must not forget that the fruits of this activity still remain, awaiting the hour of Germany's industrial and commercial reconstruction) Germany has incurred tremendous expenditures and has reaped a rich reward in the remarkable expansion of her trade and commerce. . . . The importance of the educational adaptation cannot be exaggerated for no other reason than the fact that it has been so consciously employed . . . continuation schools . . . lower trade and commercial schools . . . middle technical and commercial schools . . . technical and commercial high schools of university grade. In every class science has been employed as the handmaid of industry.*"—DR. ISAAC L. KANDEL of the Carnegie Foundation for the Advancement of Teaching, in "Comparative Education."—Ed. Sandiford.

"*Both Labour and Capital are powerless*" (the words are ascribed to a brilliant living epigrammatist) "*unless the man of ability condescends to use them.*"

THE preceding sections contain a summarised statement of publicly-advocated principles, confirmed, for the most part, by personal experience

and observation. A further word may be added to emphasise the connection which is so often remarked upon, and which might well become closer, between industry and education (in the big sense of the word) as the unfolding of personal power.

The moment one admits that business, including both commerce and industry, is as much an affair of brains as any other large-scale human pursuit, one concedes the plea that there is room for direct, and even intense, interest in its methods and processes. This has been generally recognised. But we may not have allowed quite sufficiently for the fact that though technical skill and the art of management are often highly specialised, brain-power as such is not; and for the further fact that the worker, be his task what it may, who is led to put his brains into his work, becomes by that very fact interested in it. Satisfaction in the use of our powers, certainly not least in the use of brain-power, is native to us. And the management which enlists the whole man in the worker, of whatever grade, with (as Mr. G. H. Roberts reminds us) "a head to contrive, a heart to resolve, a hand to execute," is the management that is bound to win. Education outside the Works may do much. But is it not possible that education *on the Works*, and certain that education through one's work, may do even more?

Referring largely to school experience, one of

America's foremost citizens, Miss Jane Addams, of Hull House Settlement, Chicago—whose sympathy with young life no reader of her writings or knower of her personality will for a moment hold in doubt—openly advocates in her wonderfully appealing book: "The Spirit of Youth and the City Streets," that "education must be planned so seriously and definitely for those two years between fourteen and sixteen that it will be actual trade training so far as it goes, with attention given to the conditions under which money will be actually paid for industrial skill; but at the same time, that the implications, the connections, the relations to the industrial world will be made clear." Then follows a sentence worthy to be recorded as a classical utterance from the standpoint of impregnating industry with educational ideals: "When all the young people working in factories shall come to use their faculties intelligently, and as a matter of course to be interested in what they do, then our manufactured products may at last meet the demand of a cultivated nation, because they will be produced by cultivated workmen."

Certainly, sooner or later, and sooner rather than later, education should deal with actualities. Even if there were a Higher Standard School (VI. to VII.) or a Continuation School set up on the Works, this would only partly meet the case if the head teacher and his assistants were merely schoolfolk, who had no personal part

or interest in the processes pursued on the Works. Teaching succeeds in proportion as it touches and interprets the learner's actual experience, widens his outlook, and energises his thought.

At the same time, it is not the fault of the school or the training system if mechanical, rather than intelligent, work is the order of the day in workshop, office, or laboratory. For the sake both of the work and the worker, there needs to be some direct educational influence brought to bear. Meaning must be given to the work; its relation to other parts of the process realised; an intellectual interest quickened.

A Factory cannot profitably confine itself to making things, without any concern as to whether or not it is making men. The question is bound to arise, "What is this or that individual good for?" "What can he do best?" And this, partly because industrial success depends largely upon assigning the right tasks to the right people; and, partly, because it is a commonplace of industrial and commercial life that direct training in methods, by a process which may rightly be called educational, has produced many of the best workers.*

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* This is conspicuously the case where it has been possible to retain the old apprenticeship idea without its drawbacks, as, for example, in the case of the articled clerk in a chartered accountant's office.

One of the main problems of Works management is how to lead workers on to higher efficiency. The man who says that this or that assistant is no good, and who says it about first one and then another, is on the sure way to spoiling whatever potentiality those working immediately under him may possess. There must be many cases like that of a girl who came into an office and who showed a willing spirit and did good work. She came, however, as one who had a Works record of failure wherever she had been tried. From the head of the office which she entered when she first came to the Works, the following explanation was received. A young man was her immediate senior. He had a reputation for efficiency himself, certainly; but he would have it that this girl was no use. Unfortunately, it was characteristic of him to give short shrift in this fashion; and others had to be delivered from absolute discouragement from the same cause.

However a young worker comes to us, we gain by strengthening within him the industrial virtues of *self-direction* and *dependability*. Training of this sort may take time at first; but it is labour-saving in the long run. The young industrial worker, especially, may be both an earner and a learner. (Some will go further, perhaps, and take an interest in what the young worker does at home; not interferingly, but with a friendly regard for the use of leisure, one of the truest signs, as we are being so frequently

and rightly reminded, of real educational results.) Industry can afford to be human; it cannot afford not to be human. For it to be so, is less a question of outlay than a question of purpose and spirit.

Applying, as reasons have already been incidentally given for doing, this principle generally in Works practice—the principle of putting all in possession of as broad a view as they are capable of taking and willing to take of the process on which they are engaged—we shall rid industry of the dead weight of at least one mistaken idea, namely, that the way to render oneself indispensable is to hug to oneself knowledge which might be imparted to others. Cases occur which show that the more one strives to train others, the less dispensable is one considered to be.

Ideal management will aim to let every individual worker find his feet. If initiative and self-dependence have already been in some measure acquired, so much the better; we shall build around the beginnings already made. If not, final success or failure in the history of even the best established concern may depend upon our evoking them. They are part of the make of the industrial man. A good machine will run on smoothly without being continually watched; else one individual could not be put in charge of several machines. Still more will a good workman go ahead with his work " on his own." It is not the foreman's or the boss's job to see that he does it. *It is his job to get it done;* and, ideally, the foreman or boss are there to back him up, and give help and suggestion as needed.

All this is in line with that human and industrial gospel which, under the name of "Pelmanism," has been set before our eyes in full-page advertisements and which has been popularised by wide acceptance. Its chief proclamation appears to be that man can learn and can grow; and that alongside of the man that is, whether in thought-power, in work-power, or in personality, there is the man that might be and that can be. This must obviously be the keynote of any true efficiency system. Moreover, the path of promised attainment must be shown to be not so much by greater strenuousness and striving as by a quiet and confident study of, and obedience to, natural law—that law of power which is written down in man's very being. So, culling from descriptive notices containing the Pelmanistic statement of this idea (for one could not have taken that course and have remained free to write in the unfettered way one wishes to do),* one reads of rich "mental gifts" that "have never been given the chance of development, and remain latent to the end." "Pelmanism can bring out the individuality in you." "Pelmanism, as I see it, teaches human nature—your own and the other man's. . . . It just deals with you and the other man, and life as one lives it." A well-known writer having described it as a system of mind-drill based on scientific principles, these scientific principles, we are told, "may be described in one word—Psychology." In each of these cases, the description is of something that is educational in spirit and aim. When we further read that many firms are paying for the enrolment of large numbers of their staff, it is equally clear that there are believed to be industrial and commercial applications of this large and readily received idea of every man's higher potentiality.

For efficiency's sake, we must aim to substitute individual dependability for close supervision. The best results are not got by saying "That's your job: do it! I'll set a charge hand over you to see that you do. Over him will be foremen to see that he sees that you do it. Over the foremen will be managers of different grades or departments to see that the foremen see that the charge hands see that you do your job." "Careful observation and classification of results," we are told—and how very like pernicious heresy it will sound to some—"have established the fact that the more supervision a worker is subjected to the more he falls off in efficiency."*

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* This was so, at the time of writing. The above and all previous references to the system were made simply after reading the accounts given of it by men of note. They coincided with the writer's own line of approach to educational psychology, and also with personal experiences in an industrial environment, which it would be tedious to relate but which colour all that is here written.

Since the actual writing of the monograph, however, an opportunity has come to investigate the real thing, and to enter appreciatively, if somewhat critically, into its spirit and methods. *See* Appendix (C).

To take an example: the charge hands at certain pans in a chemical works were instructed to obtain such and such a temperature in the pans before running off the liquor for treatment at the next stage of the process. This temperature was quite essential to good results being obtained and to the avoidance of the loss of much valuable material on the spot. But it became a habit to run off the liquor sometimes very far below the required temperature. Merely telling the charge hands of it seemed of no avail. But one of the foremen explained to the charge hands on his shift what a difference too low a temperature made to the whole subsequent process. Afterwards he had no trouble. They might slack a bit at their own job, regarding it merely as a water-tight affair; but if when they were wrong everything else must be wrong higher up, and they were made to see that it must be so, this was shouldering a responsibility and putting a burden upon their conscience which their conscience would not bear. Enlightenment succeeded, where urging and driving failed. Nor is the application of this principle

in any way limited to this or that class of worker. In all grades there are those who crave the opportunity to know more, and the value of whose services would be very greatly enhanced if this opportunity were given them. The foreman just referred to was a case in point. Men from all sorts of careers were put into positions parallel to his, war-pressure making it imperative to use whatever material came to hand. But he had already some knowledge of chemistry and a good insight into Works practice. He wished all the time he had been given the chance to spend a short time in the laboratory in order to gain a fuller insight into the meaning of things all round. The ignorance was a handicap, which he would gladly have had removed. Other illustrations could readily be given.

Nine times out of ten one stands to gain more by pausing to study the potentialities of an existing staff and giving a little thought to developing them, than by advertising for a man to shoulder the responsibility for men who (if given the opportunity) would to far better purpose be responsible for themselves. How often one may see things thrown out of gear by "putting in a man." The worker has a just claim that he, being on the spot, should have opportunity given to him to widen his usefulness rather than that some one should be brought in, partially neutralising him. In every reasonable way, it is well to make the worker master of his own job.

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* Mr. F. R. Sears, in a lecture on "Scientific Management in Business," delivered at the Manchester College of Technology.

This implies much; but the gist of it all is in the spirit in which his work is supervised. The freer a worker is, especially in what we all claim to be "a free country," the better is he likely to work. No small part of true oversight of others by charge hand, foreman, or manager, consists in the discovery of power in those with whom he is brought into daily contact, and the directing of this power into channels of industrial service. And what applies in a factory will apply equally in a business house. With one of the writers in "Problems of Reconstruction," a book already referred to, we need not despair of finding those who have a "real inclination for commerce." "Provided that a boy is naturally good at problems of the arithmetical sort, has a taste for geography, and has been properly introduced . . . to the really interesting problems concerned with the world's trade, the career of commerce might well excite not only his interest, but enthusiasm."

We shall gain, both immediately and in the long run, by realising that the foundations of industry and commerce, no less than the foundations of society, are in the individual life. A Works may be so organised that the individual is reached by forces making for his improvement as a worker and as a man. Some Works provide lectures on subjects related to the industry they are engaged in. Many will be helped by these. But this is the beginning rather than the end of the educational process. The best results will be gained not by reason of the few learners who become "experts," but by their becoming in their turn teachers of others. The man at your elbow who knows, and who knows how to teach what he knows—he is the real creator of your higher efficiency. While it may be physically impossible for an employer or for the manager of a large Works to get into personal touch with his workers individually, it is not impossible for foremen and others to do this as his representatives.

Stimulus and instruction; a willingness to listen to a worker's suggestions and to appreciate his intelligent interest in his work; will go far towards creating within a Works an esprit de corps which will add enormously to its fighting strength. Upon it as a foundation one may proceed without fear of failure, to build the big human notion of the whole personnel of the factory as one team playing together and making towards a common goal. One needs only to remember that enlightenment is the mainspring of interest, and to act on this consistently and as part of the ideal of management, and (without jeopardising any trade secrets) the effort will reward itself in the success achieved.

When Mr. Ford speaks of a man doing his best for you when he believes that you are honestly trying to do your best for him; and adds, "Conduct your business with the idea that you are going to manage it for the benefit of all"

—the suggestion goes beyond hours and earnings. These may form the centre of the picture, but they stand out in true relief only when they symbolise an interpretation of the values of life, and of the value we set upon each worker's life. " One way," said an efficiency expert recently,* " of ensuring success was to make successful each individual engaged in the business. Men who devoted thought to their workers found that success came in the natural course of things. When Ford, for instance, concentrated on the human factor in his organisation his success grew by leaps and bounds."

The *modus vivendi* to which this brief reference points is one that is based largely upon openness between mind and mind; upon the setting up of enlightenment and stimulus which shall bring about a higher mutual understanding Keeping to oneself knowledge that might advantageously be passed on does not give the hoped-for impression of superior enlightenment. Closing one's mind to the other man's point of view is the least effectual way of dealing with a situation. It is the better understanding, of which it is the hope of all that the foundations are being now laid, and (in the most British sense of the words) " playing the game " that will bring success.

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* Mr. F. R. Sears in the lecture quoted.

Note on Apprentice Schools and Apprentice Masterships

There is a tendency, notably in the engineering world, towards " an educational endeavour applied to the individual himself " ; the method in favour being the appointment of apprentice masters. The purpose is threefold: the individual happiness of the young worker—" as much general happiness as possible "; individual development; and collective efficiency.*

The apprentice master is neither schoolmaster nor technologist, pure and simple. Where it is not already provided for, he will take in hand recreation and similar welfare work; he may have responsible charge of the Works school, where one exists; and, beyond that, he will keep careful records of all apprentices (or youths of apprentice age) showing their aptness, capability, and readiness for promotion. Much of the duty of selecting the right worker to fill a vacancy, with the aim of " placing each boy on a secure basis of self-supporting manhood,"* will thus fall to him. A further duty will be to adjust himself and his provision for young workers to local conditions, educational, recreational, and the like; one important part of his work being to keep in touch with schools and colleges, picking out from amongst those recommended to him those who are worth a special training, say, as designers or researchers; thus both carrying back the principle of selection into the schools and supplying his own Works with promising material. If he has a staff, he can delegate some of these duties to others, and himself be free to take some share in the executive management of the Works. As suggested a few pages back, there are real advantages, from the side of his supervision of educational work, in his having direct contact with the life of the Works. Whilst, in every department in a factory, it would be well that one of the higher placed officials should have an educational bias; the apprentice master absolutely needs to link up in his own capacity industrial and educational interests. (Whether or not he has actual executive responsibility will depend upon Works conditions, upon himself, and upon the size of his staff.)

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* Mr. A. E. Berriman, O.B.E., Chief Engineer to the Daimler Company, in a lecture at the College of Technology, Manchester.

At Messrs. Hans Renold's Works, near Manchester, for example, a school is run for all boys between fourteen and sixteen as a branch of the Employment Department, the head of which has duties of a very inclusive character. The school course is based on that of a Junior Technical School. It is situated on the Works, and has a laboratory, a workshop, and a gymnasium. The mathematics are "all treated practically and illustrated from workshop problems"; the drawing includes "practical machine drawing"; the woodwork is co-ordinated with the mathematics and science, the latter consisting of practical work in physics and mechanics; the English course is designed to widen the pupil's horizon, train in self-expression, and engender love of reading. There are two libraries open to the boys—a school library and the technical library of the firm. The physical training looks beyond the relaxation it provides to the control of nerves and muscles by the will. (All boys of the same grade attend school on the same day, devoting the whole day—the morning mainly to mathematics and science, the afternoon mainly to physical exercises and woodwork; in all, seven hours per week, home work being set.)

The Education Committee of the city of Birmingham took an important step forward in November, 1918, by adopting a model form of apprentice agreement whereby the employer undertakes, amongst other things, to encourage the boy in his pledged attendance at such technical or general education classes as a sub-committee of the Education Committee shall determine: this sub-committee being the court of appeal in all disputes affecting the agreement, having the power, if they think fit, to cancel it.

CHAPTER IX

RESUME: THE SPIRIT OF INDUSTRY

"*The coming age with its marvellous development of mechanical powers must free the human race at last from its long bondage to earth, and give wings to man, by which he may rise into something like his true life.*"—ED. CARPENTER.

"*The growth and vitality of individuals and communities is to be promoted as far as possible.*

"*The growth and vitality of one individual or one community is to be as little as possible at the expense of another.*"—BERTRAND RUSSELL.

"*Co-operation is a matter of course, not a virtue: its absence is the crime.*"—HARRINGTON EMERSON.

LEAVING to the reader to turn for himself to such happily-conceived interpretations of the spirit of industry as are contained, say, in Whittier's "Songs of Labour," R. W. Emerson's "Man the Reformer," and the like, here one sums up in a few paragraphs of wholly practical reference.

. . . . .

Special or partisan pleading is, happily, no longer in court. Each has to study the other

man's point of view. What the nation can accomplish when all pull together, the war has proved; and this was accomplished, notwithstanding the army levy of some five million workers.

. . . . .

The art of co-operating is not more difficult than that of competing. To co-operate is far less costly in kind; and has a humanity value that is beyond compute.

If efficiency methods were merely a "speeding-up" device, comparable to the payment of supervisors or foremen by results or to arbitrary rate cutting,* they would have arrived a full generation too late. Frankly approached, they are not this. It is "an ideal, not a method," "a philosophy, not a routine." This is the keynote of the interpretation in the foregoing pages.

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Efficiency ideals are, of course, no exception to the rule which makes a large advance in any domain of universal human interest depend (1) upon adequate investigation; (2) upon open-minded approach and a fair hearing; (3) upon readiness to adjust and rectify, when mistakes occur. These conditions granted, the fact that all agree that some of the points urged are vital to real and sustained progress, is sufficient to throw open the door of consideration to such of the proposals as may be still regarded with shyness or suspicion.

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* It is always possible to err in fixing rates, and sometimes the mistake may be seriously in the employer's disfavour. In such cases an adjustment can more readily be agreed upon in an atmosphere of mutual trust, and where principles, rather than devices, are the backbone of our industrial policy.

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Mr. Roosevelt once said: "I believe that the soldier's tent would prove a most effective agent for democratising and nationalising our life." This factor is now at work throughout Europe. Nor can there be much doubt that Major-General Maurice, in an article on the causes of the breakdown of the German army, is right when he says: "There is a lesson to be drawn from these fundamental causes, which have led on the one side to victory and on the other to defeat. If we are to succeed in peace as we have succeeded in war we must preserve the association between leaders and led, which the practice of war has established in the manhood of the nation. If the principle which has carried us through the greatest crisis in our history can be applied to the problems of industry, if the personal intercourse between officers and men can be maintained as between employer and employed, many of the most perplexing problems and dangers which lie before us will disappear." Opportunities of calling an *entente cordiale* into being will multiply when once the desire grows keen.

. . . . .

Neither capital nor labour can produce anything until brain and spirit are brought to bear. Brain and spirit, as, again, the war has given proof, belong to man—not to this or that class of men. Industrially speaking, the joint contribution of all will advantage all. Work might become for us, as modern prophets have striven to impress, less a means to existence than its end. We live to achieve.

. . . . .

Democracy is safe for the free. Democracy is freedom's policy. And the memories and ideals of the Great War are so fresh in our minds that Abraham Lincoln's words, in dedicating a memorial to those who fell at Gettysburg, still apply: "It is for us, the living, rather to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced."

APPENDIX: EDUCATION AND INDUSTRY.

(A) *The Contribution of the School to Industrial Efficiency; with special reference to the Junior Technical School and the Apprentice Day School.*

Says Mr. H. E. Morgan in "The Dignity of Business": "You must give a boy's studies real meaning and interest before you can expect them to be of real value in disciplining his mind." What, then, can school do? A brief reference was made to the "Public Schools" and the Universities which Mr. Morgan had chiefly in mind, on page 24. How do the elementary schools, the people's schools, stand as possible contributors to industrial efficiency?

(1) Purposiveness and practical meanings may be given to the ordinary school activities without any educational loss. *Geography*, for example, may be so taught as to portray the earth's surface as man's arena. *Nature-study* partly supplements geography, as the study of man's natural environment and of the myriad forms of activity, physical, chemical, biological, which blend harmoniously, making earth a possible

home for man; and, partly, gives, or should give, a first-hand contact with some of nature's objects and forces,* giving point to Huxley's fine simile: "The chess-board is the world, the pieces are the phenomena of the Universe, the rules of the game are what we call the laws of nature. Education is learning the rules of this mighty game." Can the teacher of elementary science have a higher conception of aim than is supplied in these words and those of Vice-Consul Erskine quoted in the foot-note? *Arithmetic*, the best textbook in which has been well said to be the footrule, may be taught with a prevailingly practical reference. Real enthusiasm, for example, has been aroused by sending country boys out, as part of an arithmetic lesson, to calculate the cubical contents of a heap of farm stuff. But, of course, classes must be smaller; and the teacher must have "liberty to teach."

(2) Teachers might with advantage be given opportunities of visiting neighbouring industries; not paying a hurried, bewildering visit, but with time allowed, and visits sufficient in number,

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* After describing the nature-study courses in the public elementary schools of Chicago, Mr. Vice-Consul Erskine said: "These studies in nature are found to be of great use to children, making them observe the common things around them with intelligence, and giving them instruction about many things that working people have to do with in the course of their labours. . . . This education turns out the boys into the world with a wonderful self-reliance and capacity for seizing their opportunities. . . . Many of them rise rapidly, and at early ages are at the head of departments."—Report to the Foreign Office on "Education in Chicago," 1900.

to permit of some real study of the processes. Such visits might be associated with special courses for teachers on local industries, relief being found for teachers so visiting works and attending courses by means of reserve teachers. Of one thing we may be sure, that an industrial bias in the school-teaching will not detract from its educational value. Rather will the boys be better taught, because a firmer grip has been got of boy nature. Indeed, there are some boys for whom a teacher with the instinct of practicality (or, failing the instinct, an acquired aptitude in that direction) will provide a vitally necessary stimulus when, about the thirteenth year, the work-instinct wakes up within them, as it does in the case of not a few elementary school boys.

Once set on foot and rightly appreciated, such a meaning of school work and teaching would tend to attract men of the real "master-builder" type into the profession.

(3) As for *manual training*, now coming more and more into the schools of all nations, is there any reason why a boy of thirteen should not use a file with as much skill and accuracy as he uses the pen? Afternoon classes for elementary-school boys in Birmingham have had this effect. The average boy will be at least equally pleased and certainly benefited by dexterity with the file. And remarkable cases of mental development through manual activity could be quoted.

The work of the Municipal or County Technical

School has long been familiar. But of special importance in the movement towards greater industrial efficiency is the Junior Day Technical School with its frequent accompaniment, the Apprentice Day School. The former provides, at present, a two years' course between the ages of 13 and 15 for those intending to become engineering (or other trade) apprentices at 15 or 16. On the basis of the general school education already received—which it continues —it sets out to teach drawing, measurement, and calculations as needed in the workshop; the elements of science (mechanics, physics, and chemistry); the uses of the simpler tools used in the working of wood and metal. The staff will commonly include teachers who have had workshop experience; and facilities are given for all masters to visit neighbouring works and to study processes in actual operation.

The pupils enter a Junior Technical School by examination. The principal renders part of the service of the Apprentice Master to firms that have not yet appointed one. He visits head masters and asks if they have suitable boys to take up Junior Technical School work; and relays of Elementary School boys actually come with a master, a score at a time, to make a tour of the school, and have their eyes opened to the opportunities it affords. Men at the Works often suggest the school to fellow-workers for their boys. Again, when a worker applies for his boy to be taken on, and there is no vacancy, the suggestion is often made to send the boy for two years to the Junior Technical School, after which a place will be found for him.

Once in the school—the writer has specially in mind a Junior Technical School in the heart of the greatest engineering centre in England—the boys take up the practical courses described, a problem-character being given to their studies (especially in the school workshop), thus developing self-dependence, thoughtfulness, and initiative (the elements of mastery). During the second year, the boys, who have not by any means always chosen their definite line of work, are told what the inside of the workshop is like, and the character of the various types of work, fitting, turning, moulding, and so forth. Spirit is put into the boy's outlook upon industry, first, by a course in the history of industry, of which the aim is partly to present industrial problems as they arose and as they were solved—a course leaving ample scope for touching upon the heroic element in industry; and, secondly, by confidential talks (a sort of aside from the history course) dealing more intimately with the conditions of life in the workshop, and the kind of everyday questions which the boys will not fail to hear discussed. Much good preparation for the after-school career can thus be given by a tactful principal. During the second year the records and reports begin to take on a more definite reference to the boy's future, thus:

Name.	Wants to be	Has aptitude for	Suggested Employer.	Accepted Employer.

This is finally drawn up after conferring with the boy's parents.

A Works will usually take a boy on the principal's recommendation; the latter being careful not to send the boy empty-handed, or with nothing but a written testimonial, but with samples of his work done in the school. Apprentice managers also visit the school, and make their own selections.

Fifteen is an early, and not very satisfactory, age at which to break a boy away from a good school course; for between 14 and 15 is the moment of maximum unsettlement in early adolescence. But this break is partially atoned for in some cases by the boy's coming back for one day a week as an Apprentice Day Scholar. And a little is accomplished in the same direction by visits which the principal pays to the Works; one of the managers, it may be, going round with him, and the old principal learning how each boy is doing and commending or seeking to stimulate him, as the case may be.

There is, thus, interchange of visits between the Junior Technical School and the workshops, which is of great value. It gives a greater air of reality to the boy's work when employment managers, or apprentice supervisors, or batches of foremen from the tool-shop or fitting-shop, visit the school. Will not such visits also do something to give an educational aspect to the foreman's attitude to the youth fresh from the school? The more so, as it is reinforced by visits to the Works from the school principal, and—an essential feature—from members of the staff studying actual Works processes for the purpose of teaching.

Boys attending the Day Apprentice Courses are reported on by the school three times a year, every absence also necessarily being reported; and it will almost certainly happen that some method will be devised whereby the boy's whereabouts as a worker will be fairly well known (as it is now known informally in many cases) to the principal and teachers of the school.

(B) *School and Career: Some Practical Steps.*

Some twelve or thirteen years ago, a leading business man in Boston called a meeting of all the boys in the elementary schools in his neighbourhood who were leaving school that year. He found that they knew very little of what they had to look for in their immediate after-school life, either as to the conditions and nature of the work to which they were thinking of going, or as to whether they were suited for it or not. He opened an office in 1908, where boys and girls leaving school could receive advice. The originator of the scheme had considerable power in reading character; and this, combined with tact and kindly motives and an intimate knowledge

of business conditions, made his advice of great value in very many instances. Not that he was satisfied with such impressionist methods! On the contrary, three things became clear: first, the need of a more exact study of the actual kinds of life and activity for which this or that type of work stood—economically, hygienically, technically, and socially; secondly, the need for interesting the schools in the matter of choice of vocation by getting them to take note of the scholars' capacities and leanings; thirdly, the need for much more exact methods of discovering capacity and leaning than an interview at the office could supply.

Even earlier than this Chicago had, as part of its public educational equipment, a Child-Study Department, which the writer visited in 1900. Valuable tests and experiments were carried out in the schools; and at the head-quarters of the department was an admirable installation of apparatus for testing sight, hearing, muscular condition, and so forth, thus supplying guidance concerning the scholar's industrial outlook and his selection of a career. Any parent of a boy or girl in any of the city schools could take his child and the test was carried out and advice given free of charge.

If more of this were done for boys and girls leaving school, there would be fewer industrial misfits, and a correspondingly higher average of industrial efficiency. Six years ago the London Education Committee appointed an official psychologist for similar purposes, and has, as a result of its experience, decided to make the office a permanent one. And extensions of the work done by most committees might be made to tend more generally in the same direction.

(C) *Efficiency Systems that are Educational in Aim.*

The preceding pages grew out of a putting together of personal impressions at the instance of the Process Manager with whom the writer had been associated at a large munitions factory. Reading and investigation followed, and the writer was materially helped by lectures given at the Manchester College of Technology dealing with these themes. Once engaged in the study, it was impossible not to notice some of the announcements of the drift and purpose of Pelmanism as they appeared daily. Like many others, the writer was haunted by memories of enrolling years ago for a course in the "Art of Never Forgetting"; a course of which all had been forgotten save the title and one other fact, namely, that after one or two lessons all interest had melted away in what seemed an artificial system. Experiences of this nature intensify the feeling, in which all more or less share, of shyness of "systems."

However, after the preceding chapters had been written—indeed, directly arising out of the references made in them to Pelmanism as one

had seen it described by men of standing—an unlooked-for intervention brought the Pelman course of lessons into the writer's hands. With the permission of the Pelman Institute, this appendix is added. It is frankly critical, though, on the whole, distinctly appreciative.

On the one hand, no discussion of the spirit of industry or of efficiency ideals would be quite complete apart from references to some such scheme for the discovery and heightening of our own powers. Theories are only instrumental. Industry ultimately depends upon the ready mind and upon power in leadership and in service. On the other hand, knowing that some, like oneself in earlier days, may "take up Pelmanism" and drop it without gaining the real benefit it is capable of imparting, the writer felt drawn to assume his accustomed rôle of tutor, and to write something which, in the form of an open letter to the Pelmanist student, might help him with respect to some of the difficulties which on the surface the system may present, by enabling him to sift what is essential from what for some of its students may be of less importance. This is a bold venture, and one in which the writer has to act, albeit with permission, as a perfectly free lance.

As to the theory Pelmanism rests upon, it is, so far as a keenly critical survey suggests, weak only where it is a trifle old-fashioned. It is, for example, a little bit too late in the day to follow Bain's theory of the Association of

Ideas. One point on which criticism on the part of the Pelmanist student is said sometimes to fix itself belongs to the use that is made of the notion that there is any such law of the mind's normal working as that of the association of similar things. All one has to say is that a student who is impressed, as the present writer confesses himself to be, with the worth of the system as a whole, need not feel obliged to take over this detail or any of the suggestions depending on it as though it or they were vital to the system itself.

Portions of the introductions to some of the lessons may appear a trifle "bookish" to some students. We are not a bookish people; and, though *the general drift* of all that is written should be understood, there are some of these portions which we can afford to read less intensely. The great thing is the exercises and the suggested practice. Not one of these, so far as a very careful and critical reading suggests, could be omitted without loss.

Again, as a theory of life and of efficiency, Pelmanism is very far from being an affair of dry bones; of tips, and wrinkles, and little knacks. Where these do appear, they may be regarded judicially. They are not the soul of Pelmanism; nor are they vital to it.

In talking these points over quite freely, the writer gained confidence in Pelmanism as destined to go on with its work (the importance of which it will be the purpose of the remaining paragraphs to indicate). The Director of Studies, it was found, had already these matters in hand. The system itself—true to its own doctrine concerning men individually—is always in course of becoming; and improvements are continually being made.

It was as a student of educational psychology that the system gripped the writer. Many of the practical principles and their applications agreed with what he had himself said or written. It is a sort of systematised optimism. It appeals to a man in terms of his own powers; and holds that every one of us is far from having fully discovered himself or revealed himself to others. In every life there are both nascent and potential factors. There is that which one is just beginning to be; and on the side of potentiality the only limit to one's capacity for mental growth is the failure of the brain to function. Life is that which "always tends to surpass itself." From this point of view the key-notes of Pelmanism might be stated in the form of the maxims: "Know thyself," and "Become what thou art."

It is a veritable tonic to come into contact with a racy optimism; in some ways best of all, when the optimism concerns ourselves and life's promise to us individually. But optimism without work is void. And Pelmanism enjoins effort, the effort which reinforces a man in the direction of his own line of drive. It follows the only truly educational plan of building round the beginnings already made. It *does* build;

and that is really its art. Its method is that it accentuates you. After that, you have yourself to accentuate your aim; and an almost immediate effect of the tests and exercises is that you find yourself both more in the mood, and more in possession of the power, to do so. The system specialises for its students to a considerable extent. But its first and most important effects are general rather than particular. Making practial use of psychology which has too long remained an academic study, through the penetration and practicality of its application of laws of the mental life, it enables its students to walk up and down within their own minds, taking stock of their own capacity, discovering powers of which they have been only half aware, and which it helps them to awaken and to utilise. It quickens confidence in one's own mental power, and emphasises what seems most worth emphasising in the application of psychology to daily life. Any one who has an ideal in whatsoever direction should be lifted along towards its attainment by the effort which this system of self-training calls upon him to make.

Neglecting minor details, and taking the system as a whole, the Pelmanist teachers perform their task well for those who will work with them. It is a scheme for the adult—for the adult, moreover, who does not mind the trouble of thinking. It will not unsettle a man. It will rather stabilise him; for, leaving it to him, of

course, to find the bricks and mortar and to put the work into it, it urges upon him the vital importance of having a plan for his life-building, and puts him through a genuine apprenticeship in this insufficiently-studied art of the building of oneself. Its theory of life and its principles of practice are sound, and are capable of being, according to the amount of will that we put into it, exceedingly serviceable. This, at least, is the impression left upon the writer after a careful, and, as earlier paragraphs show, a critical reading of the lessons and study of the practice.

To sum up. After five years of crisis, peacetime reconstruction aims at an A1 nation industrially and intellectually, as well as physically. In this education, in school and after, must play a full part. In school—with classes small enough and the teacher free enough—a true foundation-laying! After school—opportunities sought and given for acquiring knowledge and experience, for the discovery of the interest of work, and for the play of the individual will! Inspirations come to the ready. For, as a keen writer on the psychology of efficiency says, "the genius has no 'faculty' which might be called an 'extra.' . . Madame Curie in search of radium and Selfridge in search of new commercial conquests exhibit the same stages in their progress: a close study of the facts concerned, an effort towards realisation, a few set-backs, then, finally, the desired result." (T. Sharper Knowlson in "Originality: a Popular Study of the Creative Mind.") Indeed, efficiency is but another name for the coming into possession of *our own powers*. The "untaught man," it may be, "does not know how to begin. Let us suppose," continues the same writer, "he is in business, and is anxious to strike out in a new direction. . . . Instead of thinking out ways and means of his own, he relies on tit-bits of knowledge he can pick up here and there. In the final issue he builds his new venture on foundations laid by other men, not on his own foundations." It is every man's motto to discover the range and use of his own powers. It is only after we have done our best thinking for ourselves that the counsel of others has its highest worth. This is every man's maxim. The "notion" to conclude with another quotation from Mr. Knowlson, "that only a highly educated man can, or ought to be allowed to, think for himself is pathetic in its ignorance; it is just as wrong as the other idea—namely, that no sort of education or training can improve the powers of reflection."

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